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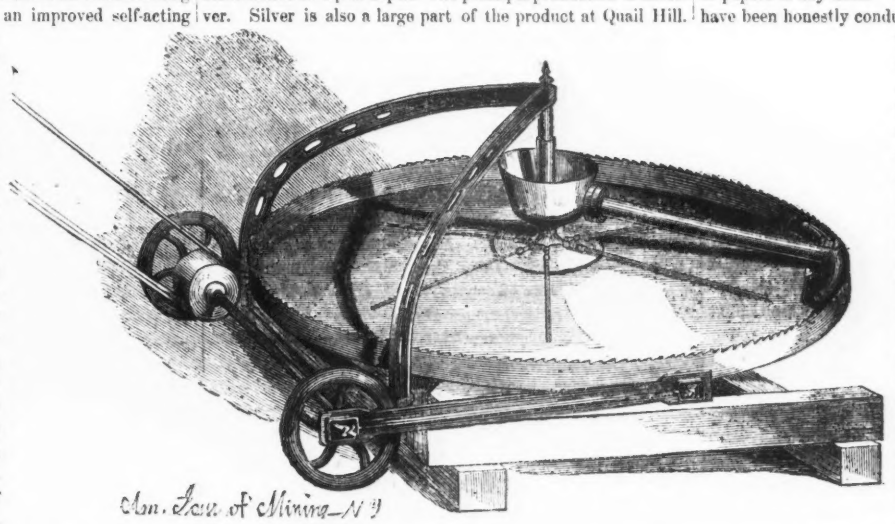
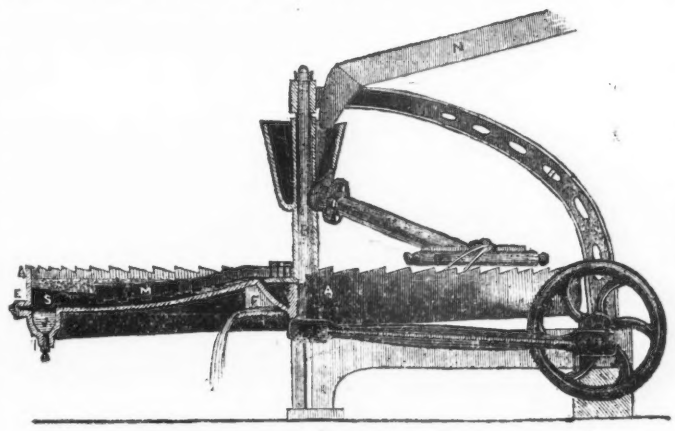
HENDY'S PATENT CONCENTRATOR.

We present our readers this week with wood-cuts, illustrating this well-known Concentrator, in its latest improved form. The proprietor has recently substituted an iron frame for the former wooden one, adding nothing to the weight by the change, rendering the machine much stronger and more compact, and considerably lessening the labor of setting it up. The revolving stirrers and rotary distributer are also late additions, which are not found in Hendy's old concentrators, but may be attached to them with little trouble and expense. The concentrator in its present form is designed for saving finely divided quick-silver, amalgam and gold from the sands, and for concentrating and saving the sulphurets, for which an improved self-acting discharge is provided. These machines can be used with any kind of reducing apparatus, and any person of ordinary experience in quartz mills can readily erect and run them. The principle upon which they are based is a combination of centrifugal force and gravitation. They have been widely used on the Pacific coast, and are *warranted to work satisfactorily.*





HENDY'S PATENT CONCENTRATOR.

FIG. 1 represents a perspective, and FIG 2, a sectional view of the concentrator. H is the support for upper end of shaft marked B: the lower end sits in a step; C, the hopper, in which the tailings are thrown; the tailings flow down the arm, K, then distribute at the distributor, marked D. The tailings enter the pan, A, at its periphery, and the debris discharges near its center and passes off in the spout F. The sulphurets discharge at gate E; amalgam and quick-silver at plug I; J, is a descending channel, for forcing the sulphurets, amalgam, and quicksilver, to their respective points of discharge; S, is the sulphurets; M, the stirrers, with copper plate coated with mercury. The rotating of the stirrers prevents the sands from packing near the centre of the pan, when the motion is diminishing. The pan A, shows a curvilinear bottom, which gives a more precipitous descent near its center, for the purpose of forcing the sulphurets towards the periphery. It will be noticed that the centrifugal force and motion diminishes towards the centre of the pan, for which reason the inclination is increased for the purpose above mentioned. Upon the underside of the distributor are small openings or perforations, through which the pulp is dropped from the feeder into the pan. The stirrers marked M, and the distributor D, are made to sweep slowly around by means of the rachet teeth upon the upper edge of the pan in which two pawls are seen to work. This motion is obtained from the vibrating motion of the pan. These pans can be so connected as in FIG. 1 so that two can be driven by one shaft or pully.

In operating the concentrator, the sulphurets are drawn off while it is in motion, in the following manner:

1. Set the pan, A, level, by its inner rim.

2. While in operation, keep the pan A, about half full of sulphurets.

3. Open the crank E, sufficiently to discharge the sulphurets as they accumulate over the amount above mentioned.

4. The crank shaft to make 200 to 220 revolutions per minute.

When the machine does not give satisfaction, it will be found that one or more of the above rules have been neglected.

MOREY AND SPERRY, 95 Liberty street, are prepared to furnish full information, and are manufacturing the concentrators in connection with all sorts of mining machinery.

Concerning Calico Ores.

We had an idea, says the *Alta California*, that the curious calico ores worked at Quail Hill and Harpending's are something new under the sun, an addition to the many singularities which are nowhere but in California. We find, however, that there is just such a formation and just such calico ores in South America. This may be important to us, as leading to some better estimation of the practical value of what we have. The calico ore mines of Chile are in every respect like those we recently described as now being worked in California. They have been worked by the family of Don Manuel Portally for a century. They are located seventy-eight miles south of Santiago, Chile, and thirty miles east of Roncuaga, province of Santiago, western slope of Cordilleras. The mine is called Leona. As at Quail Hill, the vein matter at the Leona mine is several hundred feet wide. It has been long exhausted above the water level, and the present workings are to a great depth below. There is much less water than in any other mines of equal depth. The principal production is silver. Silver is also a large part of the product at Quail Hill. At the lowest depths worked in the Chile mine, the ore has not changed its character. The sulphurets below are decomposed, as they are above the water level. Should this be the case in our California calico ore belt, it will be a great addition to its value. The Leona ores, like our own, are of low grade. But they mine cheaply. The yield in their rude arastras has averaged over $8 to the ton. The quantity is without limit, and the mine has proved a source of permanent wealth. The deposit at the Leona mine has an extent of two miles. We are not advised respecting other deposits on the extension of that mineral belt. But in Calaveras and Placer counties the same calico ores have been found at several points, and, while many places may prove barren, there is every encouragement for prospectors to search along the whole eighty miles between the extreme points at which it has been well proved to be workable, viz., at Harpending, in Placer, and at Quail Hill, in Calaveras. At this latter place the mill now about to make the regular clean-up will soon give us exact figures as to the actual profit of working the calico ores by present process, which we may be assured will be greatly improved by future experience.

Looseness in Business Operations.

At a recent mining trial before one of the District Courts in Nevada, the testimony developed an astonishingly loose mode of doing partnership business. It seems that the leading partners in a costly mill enterprise had conducted their whole business by verbal agreements. The cash advances made by one partner were much in excess of those made by the others, yet he had no legal evidence or security. Another partner purchased the mill-site in his own name, and no deed has ever been made of it to the company, nor has one been demanded, although for several years the person who bought the site could have sold out his partners at any time without redress. In like manner contracts of various kinds were entered into, and an extensive business in connection with the hauling and milling of ores, was done by several men without articles or or papers of any kind. Yet this loose partnership appears to have been honestly conducted. Payments and dividends were fairly and promptly met, and no partner suspected or attempted a wrong on the common interest. The foregoing state of facts is said to be common among leading Washoe mill and mine men, and we know that for eighteen years past such verbal, unbusiness-like partnerships, involving transactions reaching in some instances hundreds of thousands per annum, have been common in California. They would seem to indicate much friendly confidence and honor among the mining classes, and it is doubtless true that these qualities do characterize in a large degree the men who conduct our practical and legitimate mining operations. In many instances, the kind of verbal partnerships referred to are the sequel of that long and intimate acquaintance, through every circumstance of adversity and hardship, of good and bad fortune, which is the surest touchstone of character. Such partnerships are not in any case, however, to be commended; for while the mutual trust and integrity which they imply are pleasant to behold and creditable to those who illustrate them, they are full of temptation to wrong, often practically as immoral or unfortunate in their results as the veriest stock gambling transactions, and liable at any moment, where no wrong intention exists, to inflict great injustice upon the innocent and helpless. Good fellowship and confidence are just as practicable, and usually more certain and lasting in a partnership governed by careful business forms and legal securities.—*San Francisco Bulletin.*

Pittsburg Oil Refineries—Capital Invested. Capacity of Works, Etc.

The development to trade can best be shown by the amount of production, and for this purpose we have collected statistics from authentic sources, covering a period of over four years. The 22d and 23d Collection districts, in which the oil trade of Pittsburg is centered, contain fifty-eight refineries, of which there are thirty-eight in the 22d and twenty in the 23d district. Of the whole number, fifty-one were in working order on the first of the present month, and seven out of repair.

It is estimated that the amount of capital invested in real estate, buildings and machinery is $7,500,000. This does not include the sums invested in barrels, tanks, boats, and other property necessary for the prosecution of the business, which would swell the aggregate capital to more than $20,000,000.

The capacity of these works is estimated at 27,000 bbls. per week, or 1,404,000 barrels per year—equal to an annual product of 50,000,000 gallons. The largest export from the United States, in any one year thus far, was in 1866, when 57,142,296 gallons crude and refined were exported. In other words, our refineries have the capacity to produce an amount of refined oil almost equal to the entire export of refined and crude from the United States. The total production, bonded and free, from July 1, 1866, to October 1, 1867, a period of fifteen months, in both districts, was 35,872,060¾ gallons. The number of barrels of crude oil gauged during the nine months ending September 30, 1867, was 639,604.—*Commercial.*

Original Papers.

GAS-FLAME REACTIONS—VI.

By R. BUNSEN, Professor of Chemistry at the University of Heidelberg. Translated for the AMERICAN JOURNAL OF MINING, by H. ENDEMANN, Ph. D.

Continued from Page 322.

V.—REACTIONS OF THE BISMUTH COMPOUNDS.

a. Flame-coloring.—Bluish: not characteristic.

b. Coating of Reduction.—Black; dull or specular; tarnish, sooty brown.

c. Coating of Oxide.—Faint yellow; unchanged by nitrate of silver alone or with ammonia; giving likewise no reaction with protochloride of tin, but turning black from the formation of protoxide of bismuth when hydrate of soda is added.

d. Coating of Iodide.—Very characteristic, and noticeable for the beauty and variety of its shades of color; it is brown to brownish-black, with a touch of lavender-blue; the tarnish passes over into flesh-red and morning-red, readily disappears when breathed upon, and reappears when blown till dry. In the ammoniacal current the coating changes to morning-red, and becomes, when blown or warmed till dry, chestnut brown. With protochloride of tin and caustic soda solution, the reactions are the same as those of the oxide-coating.

e. Coating of Sulphide.—Umber-brown, with coffee-brown tarnish; not soluble in the breath, nor in sulphide of ammonium.

f. On the Charcoal-rod with Soda, the bismuth compounds are reduced to a metallic grain, which, when rubbed in the mortar, gives metallic scales, soluble in nitric acid. The solution gives, with protochloride of tin and caustic soda, black protoxide of bismuth.

VI.—REACTIONS OF THE QUICKSILVER COMPOUNDS.

a. Metallic Coating.—Mouse-gray, sublimated over the whole porcelain surface. In order to reduce and obtain in this form slight traces of mercury, the dry assay is mixed with soda and saltpetre, and put in a test-tube of thin glass, ten to twenty mm. long and five or six mm. in diameter. This is held with a platinum wire in the flame, and the porcelain dish, filled with water, is held over the mouth of the tube. If the quantity of quicksilver is considerable, the metal is obtained in the form of minute globules, recognized under the magnifier, which unite to larger globules when rubbed with moist filtering paper.

b. Coating of Oxide.—Cannot be produced.

c. Coating of Iodide.—Obtained in the following manner: The metallic coating, moistened with the breath, is placed over the wide-mouthed glass, FIG. 8, in which is damp bromine. It becomes black, and *after a considerable time* disappears, being transformed into the bromide of mercury. The porcelain dish is now placed over fuming hydriodic acid, and the highly characteristic carmine-red coating of iodide of mercury appears, often accompanied with the yellow subiodide, neither of which disappear when breathed or blown upon with ammonia.

d. Coating of Sulphide.—Black; not disappearing in the breath, and not soluble in sulphide of ammonium.

e. On the Charcoal-rod with Soda.—No reaction.

VII.—REACTIONS OF THE THALLIUM COMPOUNDS.

Since even a few millionths of a milligramme of thallium may be detected by the spectroscope, it is seldom necessary to prove the existence of this metal in other ways. I give, therefore, therefore, the following reactions only for the sake of completeness.

a. Flame-coloring.—Light grass-green.

b. Metallic Coating.—Black, with coffee-brown tarnish.

c. Coating of Oxide.—Colorless; not altered by protochloride of tin, with or without ammonia.

d. Coating of Iodide.—Citron-yellow; not disappearing in the breath, nor soluble in ammonia.

e. Coating of Sulphide.—Produced from the oxide; black, with bluish-gray tarnish; not soluble in liquid sulphide of ammonium.

f. On the Charcoal-rod with Soda.—Reducible to white, ductile, metallic regulus which quickly tarnishes in the air, and is with difficulty attacked by muriatic acid.

Besides the metals of the group A 2, which we have considered, there are two others, tin and molybdenum, which may be reckoned in the same group. The reduction of these two substances is not possible from all their compounds, and is always difficult, on account of their low degree of volatility; so that it is better to include them in the groups B 2, B 1, b, by the characteristic reactions of which they may most easily be recognized. (Vide p. 322.)

VIII.—REACTIONS OF THE LEAD COMPOUNDS.

a. Flame-coloring.—Grayish blue.

b. Coating of Reduction.—Black; dull, or specular.

c. Coating of Oxide.—Bright ochre-yellow; no reaction with protochloride of tin, not even after the addition of hydrate of soda; nitrate of silver alone, or afterwards blown upon or moistened with ammonia, gives no change of color.

d. Coating of Iodide.—Egg to citron-yellow; not soluble when breathed upon or moistened; disappearing in the ammoniacal current, and reappearing when warmed.

e. Coating of Sulphide.—Passing through brown-red to black; not soluble when blown upon and moistened with sulphide of ammonium.

f. On the Charcoal-rod with Soda.—Giving a gray, very soft, ductile metallic regulus, which dissolves with difficulty, but completely, in not too concentrated nitric acid, forming a white salt, easily crystallizing, soluble in water, and precipitated from solution as white sulphate, when a few milligrammes of sulphuric acid are added in drops, from a capillary pipette.

IX.—REACTIONS OF THE CADMIUM COMPOUNDS.

a. Metallic Coating.—Black, with strong brown tarnish.

b. Coating of Oxide.—Brown-black in the thick coating, passing through brown shades into a white, and hence invisible tarnish of the suboxide. This latter is not altered by protochloride of tin, with or without the addition of hydrate of soda; but nitrate of silver, without ammonia, produces in it a blue-black color of metallic cadmium, which is highly characteristic, and does not disappear when ammonia is added.

c. Coating of Iodide.—White; not colored by ammonia.

d. Coating of Sulphide.—Citron-yellow: not soluble in liquid sulphide of ammonium.

e. On the Charcoal-rod with Soda.—On account of the volatility of cadmium, it can only with difficulty, and very imperfectly, be reduced in this way to silver-white ductile globules.

X.—REACTIONS OF THE ZINC COMPOUNDS.

a. Metallic Coating.—Black, with brown tarnish.

b. Coating of Oxide.—White, and hence invisible. For further examination, it is wiped on a slip of not too thin filtering paper, one square centimetre in size, moistened with nitric acid. This is held between two rings of fine platinum wire, three mm. in diameter, and burned, at the lowest possible temperature, in the upper oxidation-flame. The ash forms a solid white scale, about one sq. mm. in size, which may be heated till it glows, without smelting. When thus moderately heated, it becomes citron-yellow, and turns white again on cooling. Moistened with a few mm. of very dilute cobalt-solution, and then heated, it appears, on cooling, beautifully green. I need scarcely say, that the same reaction may be produced with the metallic coating. Protochloride of tin, with or without hydrate of soda, and nitrate of silver, with or without ammonia, produce no reaction.

c. Coating of Iodide.—White; not easily recognized, even after being blown upon with ammonia.

d. Coating of Sulphide.—Also white; not easily recognized, even when moistened with sulphide of ammonium.

e. Reduction on the Charcoal-rod.—Not practicable, on account of the volatility of zinc.

(TO BE CONTINUED.)

ON THE COMPOSITION AND VALUATION OF IOWA COALS.

By Professor GUSTAVUS HINRICHS, Chemist of the Geological Survey of Iowa.*

Before entering upon the analyses of the numerous samples of coal submitted to me by the State Geologist, Mr. C. A. WHITE, I carefully reviewed the analyses of Prof. WHITNEY, recorded in Vol. I. of the Geology of Iowa.

Prof. WHITNEY has determined the proximate constituents of sixteen samples of Iowa coal, and reduced the same to 212° F; that is, while excluding the moisture, he retains the ashes of the coal in his final statement.

Thinking that the *combustible* part of the coal alone can be considered as *the* mineral, so that the ashes as well as the moisture ought to be excluded as accidental and really injurious constituents of the *coal*, I reduced the analyses of WHITNEY to the combustible = 100: the result of this reduction is given in the subjoined diagram, the scale of which is 1 millimeter to each per cent. (or 100 = 100mm = 1 decimeter.) The fixed part of the combustible we will call *carbon*, the volatile we term *bitumen*. The figures at the lower line indicate the order in which these analyses are recorded in the Geology of Iowa, Vol. I., Part 1, pp. 397-415 (1858).

[We regret that we cannot reproduce in the text Prof. HINRICH'S diagram, since it is a forcible illustration of his views. Without altering his manuscript, we substitute the following table, mainly based on an inspection of the diagram, and absolutely accurate only in those figures which are carried out to the second decimal place. Those who desire greater completeness may make the necessary reductions from the published analyses of WHITNEY.

TABLE OF REDUCED RESULTS.

Combustible matter = 100. Ash extra.

Analyses.	Carbon.	Bitumen.	Ash.
1	54.0	46.0	24.0
2	57.0	43.0	10.0
3	58.45	41.54	1.24
4	58.14	41.96	7.11
5	57.41	42.59	13.91
6	54.0	46.0	3.5
7	58.5	41.5	2.0
8	56.0	44.0	7.5
9	58.0	42.0	9.0
10	56.0	44.0	4.5
11	56.0	44.0	8.0
12	53.42	46.58	7.92
13	55.08	44.92	9.22
14	54.06	45.94	23.44
15	56.5	43.5	10.0
16	52.5	47.5	7.5

ED. AM. JOUR. OF MINING.]

A mere glance at this diagram shows that the great differences between these Iowa coals are due to this varying percentage of ashes, while the percentage of the carbon and bitumen in the combustible remain essentially the same in all the coals, deviating but little from the mean of

Carbon 56 } Combustible = 100.
Bitumen 44 }

which mean is represented by the straight line A B.

If, instead of comparing all the coals of Iowa, we limit ourselves to the coals of any one county, the uniformity of the combustible becomes still more apparent.

* Published in advance of the official report.

WEBSTER COUNTY, IOWA.

	WHITNEY.		HINRICHS.	
No.	Bitumen.	Ash.	Bitumen.	Ash.
12	43.16	7.34	46.58	7.92
13	41.13	8.44	44.92	9.22
14	37.21	18.19	45.94	23.94
Mean	40.50		45.82	

The deviations from the mean values are, according to

	No. 12.	No. 13.	No. 14.
WHITNEY,	+2·66	+0.63	—3.29
HINRICHS,	+0.76	—0.90	+1.12

Or, according to my reduction, the several samples differ hardly more than the possible errors of the analyses. The proper comparison of these deviations we obtain by taking the sum of their squares: these are for WHITNEY'S figures, 18.2966, for my own only 1.4020, or fully thirteen times less! According to WHITNEY'S statement these three samples of coal from three different localities in Webster county, appear to differ by fully 6 per cent. in the amount of bitumen; according to my reduction there is only an extreme variation of 1½ per cent.

It is therefore manifest, that by throwing out not only the *moisture* (as WHITNEY has done) but also the *ashes* as accidental, then these coals, analyzed by WHITNEY, differ not more in regard to the compactness of the combustible than the errors of the different analytical determinations of the same sample of coal.

Of *Illinois coal*, analyzed by WHITNEY, we have the following:

		WHITNEY.		HINRICHS.	
No.	Locality.	Bitumen.	Ash.	Bitumen.	Ash.
3	Rock Island....	41.03	1.12	41.54	1.24
4	La Salle, lower..	39.17	6.64	41.96	7.11
5	Do. upper.	37.39	12.21	42.59	13.91
		39.20		42.03	

which show the following deviations from the mean:

	No. 3.	No. 4.	No. 5.
WHITNEY,	+1.83	—0.03	—1.81
HINRICHS,	—0.19	—0.07	+0·56

or about two per cent. either way, according to the former, while only 1½ per cent. according to my reduction. The sum of the squares is respectively 6.6259 and 0.5586 or nearly as 12 to 1 in favor of my reduction. The probable errors are also respectively 1.22 and 0.35; the latter not greater than that of the actual analysis.

Mercer county, Illinois, Mr. BLANEY, Chemist of the Illinois Survey, has analyzed thirteen samples of coal from this country, which fully confirm the uniformity of the combustible for this county, although the result, as stated by him, show an apparent variation of 14 per cent. (from 19.2 to 33.4) in the amount of bitumen! (See Illinois Report, 1866, Vol. I., p. 276.)

	BLANEY.		HINRICHS.	
No	Bitum.	Deviat.	Bitum.	Deviat.
3	29.8	—0.05	36.52	+0.12
4	28.6	—1.25	36.86	+0.46
5	33.4	+3.55	38.38	+2.98
6	31.2	+1.35	35.61	—0.89
7	30.8	+0.95	35.16	—1.24
8	19.2	—10.65	35.04	—1.36
9	30.8	+0.95	36.67	+0 27
10	30.0	+0 15	35.21	—1.19
11	31.2	+1.35	37.32	+0.92
12	32.2	+2.35	36.43	+0.03
13	31.2	+1.35	36.28	—0.12
Mean	29.85	....	36.4	....
Sum of equation.....	140.41	.....		15.64
Probable error.....	2.50	.....		0.83

The sum is, by my calculation, reduced to one-ninth, the probable error to one-third, of what they are for BLANEY'S values; and the example No. 8, deviating fully 10 from BLANEY'S mean, shows only a deviation of 1¼ according to my reduction.

These examples are deemed sufficient to prove that even over a considerable area we may consider the relative proportion of carbon and bitumen in our Western coals as constant.

Thereby these proximate analyses of coals acquire a new and more important value. For if the combustible part in the coals, compared with one another, is of the same composition, its heating effect will necessarily be the same for equal weights of combustible; or, in other words, *the value of these coals will be proportional to the percentage of this combustible in the raw coal.*

Furthermore, the heating effect of two weights of different coals will be the same if both contain the same amount of this combustible (say 100); the amount of moisture and ashes, calculated for 100 combustible and added to this will therefore be the *caloric equivalent* of these coals, or *represent such weights of the raw coal as will produce the same heating effect* namely that of 100 pure combustible.

Thus the coals, Numbers 12 and 14, from Webster county, Iowa, contain respectively 80.6 and 73.4 of combustible; hence these figures express the *value* in cents of a weight of the coal equal to one dollar's worth of pure combustible; furthermore, the amount of moisture and ashes is per 100 combustible respectively 24.1 and 36.3: hence the *caloric* equivalents of these coals would be 124,1 and 136.3, that is, it would require 124.1 lbs. of the former and 136.3 lbs. of the lattter, to produce as much heat as 100 lbs. of the pure combustible, free from ash and moisture.

This valuation of coals we believe as accurate as any other

theoretical one in use; and it has this advantage, that it needs no extra work beyond that of the proximate analysis, which for many reasons, ought never to be omitted.

To directly compare our valuation with that based upon the reduction of lead, I may refer to the 700 analyses of Austrian coals recorded in Jahrbuch der K. K. geologischen Reichsanstalt, Bd. X., Heft 3, Wien, 1859. Here we find six analyses of coals from MIHALKOVITZ, in Moravia, by W. MRAZEK, viz.:

	Ashes	Water.	Combustible	Lead reduced by 100 Coal.	Lead reduced by 100 Combustible
1 Bank, upper	17.4	1.01	81.59	23.99	29.40
" lower	4.9	1.06	94.04	28.35	30.17
2 "	5.5	1.18	93.32	27.18	29.13
3 "	5.1	0.89	94.01	28.45	30.27
4 "	2.9	1.02	96.08	27.58	28.70
5 "	6.8	0.08	93.12	27.21	29.16
			Mean....	27.13	29.47

The deviations from the mean are, according to the reductions of

MRAZEK, —3.14 +1.22 +0.05 +1.32 +0.45 +0.08
HINRICHS, —0.07 +0.70 —0.34 +0.80 —0.77 —0.31

Of which the latter are all very much smaller than the former and hardly surpass the deviations between different determinations of the same sample. Practically, one hundred of the combustible in any of the above coals reduced the same amount of lead (29.5 parts.)

If we therefore calculate the caloric equivalent from the percentage of combustible matter in these coals, as shown above, and divide this by the equivalent determined by the lead-reduction, we ought to get the same quotient always; I find this quotient to be respectively

12.63 12.96 12.75 12.97 12.53 12.63

of which the mean is 12.74.

Dividing my equivalents of these coals, or respectively

122.6 106.3 107.2 106.4 105.5 107.4

by this quotient 12.74 we ought to obtain the same equivalent as directly determined by MRAZEK; we find the equivalents:

	Observed.	Calculated.	Difference.
1 Bank, upper.....	9.7	9.72	—0.08
" lower	8.2	8.31	+0.14
2 "	8.4	8.41	+0.01
3 "	8.2	8.35	+0.15
4 "	8.4	8.25	—0.15
5 "	8.5	8.43	—0.07

It thus appears that the extra reduction determination of MRAZEK was superfluous, for the comparison of the value of these coals: for my equivalent calculated from his proximate analysis fully agrees with the equivalent directly determined by him.

The preceding is deemed sufficient to warrant the following deductions:

1. The *ashes* as well as the *moisture* of coals are to be considered as impurities, the *combustible* part being the real mineral species.

2. This *combustible part* of our Western coals is very uniform in composition, even for considerable parts of the coal field.

3. For such portions of the coal field the *value of the coal is measured by the percentage of combustible*, and

4. The *caloric equivalent*, that is, the number of pounds of coal having the same heating effect as 100 of the pure combustible, is obtained by the proportion

Equivalent : 100 = 100 : value.

Or by dividing the value into 10,000.

Having completed an extensive series of analyses of coals from Iowa, conducted according to a uniform method, the result of a special series of experiments, I am in the position to add to this notice, that not only the general uniformity over considerable areas is confirmed, but the change in this composition in the various parts of the coal field seems to lead to still more general results.

ON A THEORY OF GOLD GENESIS,

Being the Substance of a Memoir read to the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, at the Buffalo meeting, August 1, 1866.

BY PROFESSOR HENRY WURTZ.

Continued from Page 291.

DISCUSSION OF THESE POSTULATES.

The first two, I believe, will meet with little or no opposition from those familiar with the present state of the chemistry of the subject, and I shall therefore submit them on this occasion, without comment.

The third and fourth postulates, however, involve the adoption of the theory of a *Sulphate Ocean*, suggested previously by others, (probably without having perceived or considered all its important consequences,) but having received, as I believe, far less attention than it demands*. I shall therefore point out two or three of those important considerations, which (leaving altogether out of view the new light arising from the discovery of the solubility of gold in ferric sulphate, and the consideration that the facts and reasonings brought forward in the sequel must rest upon this postulate as a corner-stone,) will, I trust, convince the reflective reader that a primeval sulphate ocean must be accepted as the only view that will bind our knowledge into a consistent theory. I ask first, therefore, whether there are not certain agencies still at work continually which must have wrought from time primeval in the same way, though doubtlessly with constantly diminishing intensity. One of these is the agency of atmospheric carbonic acid, precipitated by condensing rains, fogs and dews, and assisting in the destruction of calcareous silicates by dissolving their lime, and washing it down into the ocean, there to be precipitated in different forms. Whence came the sulphuric acid of the enormous masses of *gypsum* that have been crystallized from the ancient seas, extending throughout many geological eras, unless from the waters of those seas? And if the lime of these gypseous deposits, with that of the sedimentary calcite and dolomite rocks, came from calcic chloride, in the earliest seas, whither has gone the lime proceeding from the enormous destruction of calciferous hornblendes†, pyroxenes and other lime-silicates throughout the ages? I would add that a primeval sulphate ocean, though necessarily (like our present ocean again) comparatively destitute of lime, and serving but its allotted purpose in the grand system of the circulation of the waters, as the medium for the convection of the lime of the primary silicates of the continental nuclei to the oceanic floor, may nevertheless have been, (and, indeed, must have been,) a highly *magnesian* ocean: and such a theory is thus wholly in accord with the recent investigations and results of STERRY HUNT regarding the formation of magnesian rocks. The excess of carbonate (or bi-carbonate) of lime above that which went into organic forms, or in those deeper seas which were too hot or too saline for organic life, would go to form, (especially in the strongly carbonic atmosphere, as HUNT has shown,) the great beds of gypsum with dolomite which are so prevalent.

It will be seen that the tendency of the theoretical views here presented is to support, to a certain extent, those who hold that we should find in agencies *still at work* the explanation of all existing results and past changes upon the earth: but I wish to point out emphatically that I wholly dissent from the extreme "quietists," who would maintain that such agencies had in the past no greater power, and their effects no greater rapidity or intensity than at present. While, for example, I would avoid entirely the violent hypotheses of "cataclysms" to produce the Niagara gorge, the "Big Cañon" of the Colorado, or the Mississippi delta, I look upon the excessive allowances of duration, now generally made, to explain quantitatively these phenomena, as equally objectionable and even untenable. Thus, in the three cases mentioned, the simplest chemical deductions from the facts prove to my mind, with mathematical certainty, that we must recognize, as we go back in time, an increase in intensity of action of the present agencies even in a rapid *geometrical* ratio. The erosion and solution going on, and which have produced the phenomena, imply an immense and elevated mass of matter that has been eroded and dissolved. But greater elevation implies also greater intensity of erosive agencies, greater floods of condensed water, greater rapidity of frost-disintegration, and so on. Thus, in the cases of the Colorado and Niagara, greater volumes of water to undermine, dissolve and degrade, and, in the case of the Mississippi and other deltas, greater masses of sediments to be deposited, are implied. The special cases here cited belong, of course, (with the possible exception of the Colorado gorges,) to the latest geological periods, almost certainly since the cenozoic dawn, and, some think, only within the age of man; but the reasoning I have applied is pertinent, even in a far higher degree, to older eras.

Our fifth postulate also demands careful consideration, as the objections urged thereto will doubtless be many, and at first sight forcible. Some will deny that organic life could exist in a concentrated saline solution—especially at the high temperature supposed to have then existed. Others will object on the ground of the reputed antagonism of carbonic acid to organic life, when present in air as but a small per centage; others on the ground of the greater pressure which must have resulted, under the theory, from the load of aqueous vapor, etc., carried by the atmosphere. It will therefore be urged by these that as we now have cumulative and irresistible proofs of the existence—even in the "azoic" times of which we are treating, almost in the infancy of Ocean herself—of her animal progeny, (implying of necessity vegetable existence also,) in the *palæotrochis* (no longer to be jealously ignored) and the *eozoön*, (no longer to be skeptically denied,) with others of less conclusive character, (as, for example, the graphites and apatites of the oldest rocks,) therefore our whole fabric of Chemical Geogony is tumbled into ruins, and we must revert to the views of the quietists‡, or those who hold that the conditions, as well as the agents of the changes, both in the sea and air and on the land, have always been substantially as now, in both mode and measure. I have before stated what I think unanswerable reasons why the *measure*, at least, of these changes, and of their implicated causes, must have been formerly immensely greater than now; but I shall proceed to show, further, that all the above objections are founded upon too narrow views—only, as I think, to be held tenable by those who deny altogether the value of chemistry as an instrument of geological investigation.

Thus, is it not indisputable that the huge masses of sediments forming the bulk of existing continents have been formed and derived from the degradation of elevated and exposed portions of the earlier surfaces of the continents themselves? Our great geologist, DANA, even uses the following language: "The *original crust* is now so disguised amid these later crystallized deposits, which are here called Azoic, or is so buried beneath them, that geology can hardly expect to identify any portion of it."§ Even if this startling conclusion, derived from a work which is an absolute marvel of profound and exhaustive research and of mature generalization, be not altogether allowed, it will be admitted that any exposed surfaces of the original crust must be sought, if anywhere, upon the mountain ridges which have been most eroded and degraded, as constituting the crests of the continental watersheds. Can we doubt that these mountain chains, whence have thus been derived originally almost, if not quite, all the materials we know upon the present surface, must have been once enormously (say, not improbably, ten times) more elevated than now; or, to make an affirmative reply to this question more inevitable, is it not certain that the original elevated bulk and surface, from the *debris* of which the continents have been made, must have been very many times *larger* than our present equally elevated bulk and surface of mountain land? Notwithstanding the greater height and density of the atmosphere, and the higher temperature of its lower points, called for by our theory, may there not even then have been peaks capped with perpetual snow? And, in any case, an immense zone must have extended high along their sides, within which the conditions of temperature, pressure and moisture fell within the limits of those of organic existence, even as now known. I must here say that I am only supposing an extreme case, far beyond what any one supposes to have then existed, in order to give greater force to the argument. To complete the case, I shall give a few lines also to the subject of carbonic acid, the importance of which has been rated so high, in the absence of any general satisfactory knowledge of the degree of toleration of this agent, (whose poisonous character has been so greatly exaggerated in popular estimation) even by the animals and plants of the present day. It is surprising to find, however, what weight this argument has given to the hypotheses of the quietists, and I shall endeavor, therefore, to show that a few simple chemical considerations will set it at rest altogether—even in its supposed applicability to these primeval ages, and far more especially in regard to later eras, the Carboniferous, for example, when a large proportion of the original carbonic acid had already been locked up in limestones, etc.

The first chemical fact I shall appeal to is that of absorption of carbonic acid by cold water. Would the shroud of condensed and condensing vapors which must have enveloped the whole of the inferior slopes or flanks of the primary continents, (and, in fact, formed a continuous pall over the whole earth at a certain height in the atmosphere,) and the floods of cold water proceeding therefrom, have had no effect on its composition, in these localities at least? When we consider also the great increase of this absorption by pressure, it seems credible that in those days there may have been large districts near the sea-coast, the air of which was as poor in carbonic acid as our own is now. Even the comparatively slight and but occasional clouds formed at the present day are known to exert an appreciable and (practically) highly important action in this way, so much so that careful analysts have found a perceptible increase in the proportion of carbonic acid as we ascend into

*Professor STERRY HUNT is one of those who in past years have advocated this theory, but appears of late to have abandoned it for others that are much more difficult, I think, to reconcile with facts. Thus HUNT suggested some years since that the composition of the primeval ocean had been placed on record and handed down to us in the forms of the concentrated brines, rich in calcic chloride, found permeating some of our ancient rocks, particularly those of silurian and devonian ages, and issuing thence as mineral springs, and from artesian wells. This ingenious hypothesis of the existence of "fossil sea-waters," which he has again brought forward forcibly in his recent lecture to the Royal Institution in London, on the "Chemistry of the Primeval Earth," (while admitting its novelty, suggestiveness and beauty,) I can only accept with an important, and, I think, obvious limitation, namely, that, at most, it can prove only those particular seas in which the silurian and devonian sediments were deposited, to have had this special composition; and it is generally held by eminent geologists that these were in all probability detached seas, nearly or quite *landlocked;* and, being isolated from the great outer ocean, may have had, like the examples we still possess, on a comparatively very small scale, (our Dead and Caspian seas, our Great Salt Lake, etc., etc.,) a very different composition therefrom. Another pertinent and obvious argument arises by bringing in the element of *time;* for few geologists would admit that the particular epoch of the silurian seas could furnish us with necessary or even probable conclusions regarding the more distant time we are treating of, when the ancient rocks of which these silurian sediments are but themselves the reconstructed ruins, were being formed. But this is a subject on which very much remains to be said, and which cannot be adequately treated in a hasty note.

†While engaged on the geological survey of New Jersey in 1854, (see report on the geology of that State for that year,) I showed that the bases in the black hornblendes, so abundant everywhere in the crystalline schists of the New Jersey Highlands, were *chiefly lime.* The few quantitative analyses we possess of pyroxenes from the rocks of our Appalachian chain show most frequently a predominance of lime over magnesia. Whether we have here an important index to a general fundamental distinction between the silicates of primary and secondary rocks, is a point worthy of further attentive examination.

‡The term "quietist," as here used to designate this school of geologists, I have derived from a paper of Professor Sir WILLIAM THOMSON, of Glasgow. "On the Secular Cooling of the Earth," published in 1862, in which he attempts to prove mathematically, among other things, that the "general climate of the earth could not have been sensibly affected by *conducted* heat (from the interior) at any time more than 10,000 years after the commencement of superficial solidification;" admitting, however, that it might continue to be *locally* affected "for the first three or four million years." While believing that Professor THOMSON'S minimum of 10,000 years would be all-sufficient for our theory, yet I would remark that in all probability his allowances for rapidity of cooling by radiation have been far too high; and that, as STERRY HUNT has suggested, TYNDALL'S discoveries of the impermeability of both carbonic acid and aqueous vapor to low radiant heat, must be included as important data in any theory of this subject—the atmosphere of those days having beyond doubt served as a *blanket* to keep the earth warm, limiting the mode of loss of heat chiefly to convection. Also, as I understand Professor THOMSON, his theory assumes necessarily the earth to have had a *solid* surface during the whole period, and takes no account of the influence of a mobile enveloping ocean, in the convection and distribution of heat from inner to outer parts, and from one part to another of the crust, which was then so often disturbed and upheaved.

§DANA'S Manual of Geology, page 143.

the higher regions, which are freer from clouds and moisture, and where the pressure is less.

I wish, in passing, to point out again and more particularly, the important applicability of the arguments I have above brought forward to the theories of *Coal Genesis;* as geologists are agreed that the carboniferous surface was one of immensely extended plains, continually bathed in fresh water. A great stumbling-block has always been the apparent incompatibility of the known fact that recent plants such as are found in the coal (ferns, etc.) perish in air made rich in carbonic acid, with the necessary consequence that all the carbon of the coal must have been drawn from the atmosphere in which it grew. Does not my mode of viewing the subject remove this obstacle without the violent supposition of any physiological difference, either in the manner or measure of their nutritive and digestive functions, between the plants of this and that day? The total proportion of carbonic acid in the carboniferous atmosphere may have been far greater than now, and yet the tropical vegetation may have proceeded in a medium from which the injurious excess was wholly removed by the absorption of fresh cool waters under pressure.

The subject of the genesis of coal, having a certain relation to my complete theory, will be recurred to in the sequel.

Another mode in which I have viewed the carbonic acid question is too remarkable in its results to be wholly passed over here. In endeavoring to find some data for numerical calculation which would enable us to grrsp the subject, I find it stated generally in the books that warm-blooded animals have been found to possess more or less toleration for an atmosphere carrying six or seven volumes per 100 of carbonic acid. (The test I desire is to find, approximately, whether it is likely that the conversion of all the carbon extant in the mineral form, as coal and carbonates, into carbonic acid, would raise its proportion in the atmosphere to the toxical point.) The above proportion by volume corresponds to about ten per cent. by weight, which (supposing, for simplicity, the whole atmosphere to have been then no heavier than now,) would be 1.5 lb. per square inch, or 216 lbs. per square foot: equivalent to very closely 500 lbs. of pure carbonate of lime per square foot of the whole earth's surface. This, in the compact form of crystallized calcite, would make a stratum or shell over the whole earth of over three feet; or, in the lighter form of *chalk*, say ten feet in thickness. As few geologists would maintain, however, that probably more than one-twentieth (say ten million square miles) of the formations known include rocks abundant in lime, we here have the rather startling conclusion that a primeval atmosphere containing but ten per cent. of carbonic acid is adequate to explain the formation of calcareous strata equal to 200 feet of chalk, covering ten millions of square miles! This is about one-fifth of the present continents.

To conclude this branch of the subject, let us return to a brief consideration of what our theory needs to cover the actual facts. We must believe the eozoon and the palæotrochis to have been inhabitants of the shallower waters of the oceanic shores of the original continents. But it may be said, and undeniably, that such intensely hot saline waters as those of our primeval ocean could not have been inhabited at all. Let us therefore examine a little further. Higher and more extended mountain ranges or plateaux imply also more rapid radiation into space, and greater relative differences in subæerial temperature than now. Therefore far greater distillation and condensation were going on then than now. Below a certain zone of elevation the ancient continents must have been flooded with water, falling not in showers, but in constant *cascades*, pulverizing, oxidising, carbonating, decomposing, channelling and undermining the whole surface of the slopes below, (as our most violent mountain torrents and inundations are locally observed to act,) and thus necessarily lining the coasts continually with a wide belt of muddy water, sufficiently cooled, diluted and at rest (certainly in the many wide bays and estuaries which were constantly forming and changing) to admit of the existence of any amount of organisms, both marine and fresh water, that are likely ever to be found in these earliest sediments.

[TO BE CONTINUED.]

Mining Summary.

GOLD AND SILVER.

California.

Plumas County.—The following items of mining news from Southern Plumas are taken from the Downieville *Messenger*, of Oct. 26: The celebrated Union company, on Howland Flat, one of the best conducted mines in the State, are working from eighty to one hundred men, and have lately repaired and improved their hoisting works and sluices, and are taking out the richest kind of pay. This company have prospected rich ground enough to last them for four years to come. The tailing ravine claims of Knowles, Cox & Co., below the Union company, and which wash tailings from the above claim and others, have realized in dividends nearly $1,200 to each one-sixth interest for their season's work, over and above all expenses, after erecting a costly and substantial dam to save and regulate the tailings in the ravine. .....At Chandlerville, which is between St. Louis and Howland Flat, the Anderson hydraulic claims have paid the proprietor about $5,000 over and above all expenses. The Campbell diggings, at the same place, have realized over $20,000 above all expenses, and are still washing bottom dirt uncovered last spring.....At Pine Grove, the French company are progressing finely with their drain tunnel under the Sugar Loaf Co.'s ground, which, when completed, will be 2,000 feeth in length. When they get in again they will work the richest of dirt, as they have been there before and know what to expect.....The *National*, Oct. 19, has the following: At Rush creek the mines have been paying better this season than they have for several years past. Fred. Lewis, last week, took out of his claim three hundred dollars to one pan; one piece weighing eleven ounces. The other claims pay half an ounce to an ounce a day to the hand..... The Quincy *Union* of the same date says: Messrs. Kelly, Lee & Co. finished cleaning up in their claims on Hungarian Hill, near American Valley, a couple of weeks since. We are not informed as to the exact amount taken out by the company during the past season, but hear it estimated and reported to be from $16,000 to $24,000. The last named figures are no doubt the nearest to the amount. There are but four interests in the company.

Sierra County.—A letter in the San Francisco *Times*, dated Alleghany, Oct. 19, says: Mining is looking up in this district. I prophecy that Alleghany will some day become as famous for its rich quartz as is Grass Valley. The deposit of quartz is immense. Several new and rich ledges have been discovered, among which is the Docile, located a short distance above the Twenty-one company's mill. This mine is undoubtedly one of the richest that was ever found in this State. It was discovered this summer, and its owners have taken from it with a hand mortar some $20,000. One quarter of it has been sold to some San Francisco men for a mill, which is being constructed, and is nearly ready to run. It is said that another quarter interest has been lately sold for $25,000. The extensions have been located and all proved good. This discovery has given a fresh impetus to mining in this locality. Barstow & Mix have leased the Twenty-one mill to test their ore, which it is thought is good. The ore from the bottom of the new shaft on the Twenty-one mine is rich—full of grey sulphurets. Why this company do not work their mine with such ore is a mystery. It is reported that the company has "pegged out." How this is, however, I do not know. The Union mill and mine are also sleeping. Here is a fortune for capitalists. No mine ever made a better showing for the same amount of labor. But little work has been done, and yet over $127,000 have been taken out, giving a net sum of over $40,000. Mismanagement has been the cause of its present condition. The Oak Flat is looking first-rate, as well as many other mines. I predict a better future for this out-of-the-way place before long.

Tuolumne County.—The Sonora *Herald*, Oct. 19, understands that the owners of the Sellman lead, situated on Bald Mountain above Brown's flat, have struck rock of unusual richness, being considerably more than one-third gold.

Amador County.—Last week, says the *Ledger*, Mr. Thomas Brady sold his interest, one-fourth, in the Kennedy mine to Mr. B. F. Langford, of Woodbridge, for the sum of ten thousand dollars. This mine is located on the north side of Jackson, and is about one mile distant from the court-house, and has been worked from the surface to a depth of two hundred and fifty feet, where they are taking out rock from a vein eighteen feet wide which pays, by mill process, from $28 to $54 per ton. The expense of working this mine, compared with many others in this section, is trifling, as it is comparatively free from water, and its location all that could be desired.

Alpine County.—The *Miner* says of the Tarbish mine: This mine is looking well; better, we think, than at any previous time. The winze at a depth of 35 feet struck a rich pocket, which on being drifted upon, yielded several tons of first class ore, and good ore is found at several other points. In the face, nearly one hundred feet in the ledge, small pockets of rich ore are numerous.

Nevada County.—The Red Rock Tunnel company, says the *Transcript*, was incorporated for the purpose of opening a tunnel from the Yuba river to the extensive hydraulic claims about Empire flat, and when finished will give an outlet for a large district of as good mining ground as can be found in Nevada county. The tunnel was commenced low down upon the banks of the Yuba, and is being run upon a seam in the rock. It is now in about 2,000 feet, and the distance to the flat is probably as much again; but the workmen have been greatly encouraged by the fact that Black Bros., in opening their ground on the flat for surface washing, have crossed the identical seam upon which the tunnel is being run. In deep tunnels it is difficult to ascertain the exact direction, and they sometimes do not reach the point designed, but these parties have a sure guide in the seam in the rock. The stockholders in the company organized for this great enterprise are, we understood, all working miners, who pay their assessments by so many days' work. We hope they may all reap fortunes as the fruits of their enterprise.....A rich quartz ledge was discovered a few days since by Charles Ott and Lewis White, on Deer creek, about a mile above the Oriental mill. The ledge is fifteen inches wide on the surface, and shows free gold all over the face of the rock. The quartz has a rich seam of sulphurets running through it.....The Marietta mine is located at Devil's Knob, nearly on the top of the mountain above the Tecumseh. It is owned by an incorporated company, and worked under the supervision of Marvin and Lindsey. A five stamp mill, run by a "hurdy gurdy" wheel, has been erected, and is kept constantly at work upon rock which pays from fifteen to twenty dollars per ton. They are now taking out rock from a five and a half foot schute which yields $20 per ton, without working the sulphurets. One man taking out rock keeps the mill running day and night. The total cost of mining and milling the rock is only three dollars per ton. The Marietta has been opened by two tunnels on the ledge. The upper one is in 60 feet, and the lower 120. These tunnels are run directly upon the ledge, and the lower one now has one hundred feet backs, which increase as it is driven in. The Marietta company have another ledge from eight to twelve feet thick, which is rich in fine gold and sulphurets. The ledges of this locality offer great inducements to capitalists. They are all large and can be worked to a great depth without the aid of hoisting works, and besides, there is seldom a question of the title.....The Mary Etta mine was located by Spring & Co. at Diamond creek, about a year ago, and lately sold to James E. Perkins for a San Francisco company which has a working capital of $50,000 in cash. The machinery for a 20-horse engine to be erected upon this claim is now on the road, and a five stamp mill, which can be increased to ten if necessary, is to be erected immediately. Thirty men are employed, opening tunnels and getting the mine ready to take out rock rapidly. The Mary Etta was worked from its location up to the time of the sale without an assessment.

Nevada.

Return of Mines in Nye County.—The Silver Bend *Reporter* says: We find upon the books of the County Assessor the following returns, giving the amount of bullion and yield per ton of the mines of Nye county for the quarter ending Sept. 30th, made under oath. The amounts are for coin:

Name.	Tons.	Gross.	Amount per ton.
Twin River Co., Murphy Mine, Belmont Co.,	800	$107,544	$143 43
Transylvania 1, Belmont Co.,	736	28,856 88	39 33
Transylvania 2,	21	837 06	39 86

Following are the returns of small lots of ore from this county, worked at mills in the vicinty of Austin, and forwarded by the Assessor of Lander county. We merely give the number of pounds of ore worked and the gross product:

	Pounds.	Gr. yield.
Indian Jim, Hot Creek District	1,915	$90 80
Old Dominion, Hot Creek District	3,630	206 24
Gazelle, " " "	11,314	753 30
Desert Queen, Reveille District	3,083	474 86
Wild Rose, " "	2,277	149 69
North America, " "	1,172	68 75
Manhattan, " "	2,639	292 01
Lord Byron, " "	2,254	106 85
Button, " "	600	8 84
Regan, " "	2,792	30 68
Lexington, " "	2,764	235 00
Peta, Union District	1,971	68 46
Holman, Union District	2,031	295 34

The books of the County Assessor show the following annual product of two of the leading mines of Nye county: From Oct. 1st to Dec. 31st, 1866, the Buel mill (now the Belmont company's) reduced 904 tons of ore, producing bullion of the value of $52,712 24, being an average per ton of $58 31; the three months following—January, February and March, 1867—554 tons and a fraction were reduced, yielding $33,041 39, or $59 64 per ton; the next quarter, 125 tons, 1,339 pounds, producing $6,903 02, $54 93 per ton, and 676 tons, 1,010 pounds, which produced $26,439 77, or $39 08 per ton. The amounts added to the production of the quarter ending on the 30th of September, of 736 tons, yielding $28,856 88—$39 33 per ton, and 21 tons, yielding $837 06—$3 986 per ton, swells the total product of this mine for the past year to $148,790 36 in coin. The aggregate number of tons of ore worked is a fraction over 3,917—averaging very nearly $50 per ton. It was reduced in a ten-stamp mill, at best but an inferior one, by the wet crushing process, by which it is not claimed that more than about 65 per cent. of the silver is saved. In connection with the fact that the mine from which the ore was obtained is practically inexhaustible, and can be made to furnish almost any amount of ore, the above figures will furnish a basis upon which to estimate its great value. During the same period, the Murphy mine, of the Twin River company, situated in Ophir canyon, as is shown by the books of the assessor, has yielded as follows: 1st quarter—626½ tons, averaging $132 49 per ton, $83,007 96; 2d quarter—1,161½ tons, averaging $84 18 per ton, $97,775 08; 3d quarter—805½ tons, averaging $92 94 per ton, $74,863 17; 4th quarter—800 tons, averaging $134 43 per ton, $107,544, making a total of $363,190 21 in coin in a twelvemonth. The aggregate quantity of ore worked is 3,393½ tons, and the average yield per ton a fraction over $107. We are informed that the Murphy mine is now in a condition to supply ore for another mill of equal capacity as the one in use, a number of levels having already been run which disclose hundreds of feet in length along the vein, and for a depth of near two hundred feet, a compact mass of solid ore some ten or twelve feet thick. This vast metallic mass is said to surpass anything of the kind ever developed in the State, and as our information comes from a competent source, we do not doubt it; and the Murphy to-day could doubtless be made to produce more profit for its owners than anything ever found upon the Comstock, though by reason of some stock-jobbing operations said to be on the tapis, there seems to be a desire in certain quarters to conceal for the present its true merits.

Meadow Lake District.—A correspondent writing from this district, under date of Nov. 1st, and who is perfectly reliable in his judgment as a miner and as a superintendent of a mill, says the Gold Hill *News*, sends us the following rather cheering news: The Kentucky company are driving the work ahead on their mine with great vigor: The lower tunnel is now in a distance of sixty-eight feet, and the shaft which is being sunk from the surface above to connect with the tunnel is down twenty feet. They are now erecting a house over the shaft in order to protect the workmen from the inclement weather of winter. The work is being prosecuted night and day. Mr. Chappalett, superintendent of the Mohawk and Montreal mill and mine, is making great headway in his experiments for the reduction of the ores of this district, and for saving the large quantities of sulphurets and chlorides which abound in the ores. Millions of dollars in sulphurets had run irrecoverably to waste, on the great Comstock ledge, until within a couple of years past, when the miners invented their blanket-bottomed sluices for saving these liquified particles of precious metal, the saving of which, I am told by the best authority, is worth a million a year on the Comstock alone ... . Quite a number of the mining companies in Meadow Lake intend to winter here, and they are accordingly building warm cabins, and also substantial houses over their mining works, so as to keep in operation, as next summer will reveal some wonderfully rich gold mines here. It cannot be otherwise, as the deeper every shaft is sunk, or the farther the tunnels penetrate the ledges, the richer the ore is, not only in free, sparkling gold, but also in sulphurets. But it takes cash to build mills, hoisting works, and to sink shafts and to run tunnels, and however rich a mine may be, if its owners have not the coin to develop it, its hidden bullion will remain in its normal condition.

Pahranagat District.—We are informed by Mr. D. Daly, who arrived here yesterday from Pahranagat, says the *Reveille*, Nov. 8th, that the ten-stamp mill of the Pahranagat M. and M. Co. was not yet finished, in consequence of the delay in the arrival of the machinery. The buildings were completed, the engine and boiler were set, and the foundations were laid for the roasting furnaces; and the mill could be completed in a short time after the receipt of the necessary castings and machinery. The mill structure was built under the superintendence of Benj. Evans—the architect of the reduction works of the Twin River company—and is pronounced by Mr. Daly to be both substantial and handsome. Pending the completion of the mill, there is not much activity in mining operations in the district, although a few mines are worked steadily. The Indiana ledge, which belongs to the mill company, looked exceedingly promising, and was producing a fair quantity of good ore. The Illinois was also worked by the same company, and continued to develop well. Another ledge, called the Webster, was producing an excellent quality of ore. Springer, one of the earliest settlers in Pahranagat, was doing some work on several ledges for an Eastern company. Hiko, the town and county seat, improved a little during the past summer, and will become a lively place as soon as the first mill works successfully. The present residents of the district have the fullest confidence that there are good mines there, in spite of the bungling management and waste of money which have been the characteristic features of some companies. They have faith and patience to wait for the end.

Battle Mountain District.—From Hon. J. J. Linn, who returned a few days since from Battle Mountain district, says the Humboldt *Register*, Oct. 19th, we learn some particulars respecting its ledges and general surroundings. The district is situated about fifteen miles south of Humboldt river, which skirts the bend of the mountain. Wood is scarce, sagebrush being relied on as the principal fuel in the vicinity of the mines, but mountain cedar and pine may be had at a distance of fifteen miles. Four miles from the mines there is a stream that runs about one hundred inches of water at the dryest season of the year. In the immediate vicinity of the mines there are some springs that furnish sufficient water for the miners. The principal ledges located are the Buena Vista series, which consists of three large and well defined ledges, the upper one of which is about forty feet in width, and the other two from ten to fifteen. Some twenty assays of the ore, taken without selectian, have been made, the lowest of which gave $50, and ranging from there away up into the hundreds. The ore is decomposed, and in appearance much resembles the best of the Golconda ore.

Castle Peak District.—A correspondent of the Sacramento

Union, writing from Aurora, says: The Carsan and Virginia people evince great interest in the mines of Castle Peak district. I am informed that last week they bought four hundred feet in the Dunderberg ledge, and paid $8,000 for it. Shafts have been sunk on the ledge for a mile in extent, and they have got the ledge in all of them. It is said that it can be traced for three miles and from fifteen to twenty feet wide. The rock is rich in gold and silver; 1,500 pounds of it was worked here in Coffee's mill last week, and they took the bullion to Carson for assay.

Nova Scotia.

Mr. D. W. Cairnie, of Boston, thus reports, after an inspection of the Nova Scotia gold mines: Sherbrooke is situated on the St. Mary's river, about a mile to the eastward of Halifax, and is a small town of about six hundred inhabitants; and the mines are situated about two miles from it, on the opposite bank of the river. The mining companies which I find in full operation in this locality are the Wellington company, the Palmerston company, the Dominion company, the Sherbrooke company and the Hayden company. The Wellington mining company's property was the first that claimed my attention. This mine has been in operation for three years, and has proved to be a very remunerative investment, yielding twenty-five per cent. per quarter on the whole capital of one hundred thousand dollars in several returns, and consists of twenty-five mining areas, three leads being now worked to the depth of two hundred and ten feet. This company is now engaged in erecting a steam engine of twenty horse-power for hoisting and blasting purposes, and is building a new quartz crushing mill, with sixteen heads of stamps. The quartz taken from this mine has given a yield of from three to four ounces of gold per ton, and it is now under the able superintendence of L. Snow, Esq., of Boston. The Palmerston company was the next property that I examined, and also consists of twenty-five mining areas, and showing about forty leads, six of which are now being worked. The main lead I examined and found to be over three feet in width, and the quartz well charged with gold. Mr. Snow, who is also the manager of this property, placed in my hands a bar of gold just from the retort, weighing over six hundred ounces, and assured me that after paying all expenses, there remained from this bar a net profit of nine thousand dollars. The Dominion property is under the skillful and efficient management of S. Goodall, Esq., of Colorado, and I learned that this company was organized by Carlos Pierce, Esq., of Stanstead, Canada, in the city of Montreal. This property consists of nine mining areas, and is traversed by twenty-five well-defined leads, averaging from four to fifteen inches in width, four of which are at present being worked by means of one main shaft, several cross-cuts being driven from this to the several leads. The returns thus far from this mine have been highly remunerative, and I am of the opinion that it will prove a first-class and permanent investment. I will only add in reference to this locality that the Sherbrooke company's property produced during my stay there, from one crushing of twenty tons of quartz, a yield of two hundred ounces of gold. This company had some discouraging results to contend with for some time, but their present success has more than compensated them for all the past outlays, with a promise of splendid success in the future, which reflects credit upon the enterprise of Mr. Pierce, who organized this company in New York. I then proceeded to Wine Harbor, which is situated at a distance of twelve miles from Sherbrooke, on the Atlantic coast, and I consider this locality a very rich gold field. It has not as yet been largely developed, although the Caledonian property in this section produced in six months over two hundred thousand dollars in gold; but from the inexperience of the managers of this property, a large extent was opened from the surface, leaving it exposed to all the surface water which might accumulate, and operations had to be abandoned until machinery could be brought into use, but which is now in full operation. The Orient gold mining company is the only other mine that I had time to examine there. This property consists of twenty-two mining areas, and is situated on a somewhat elevated point of land opposite Barrasor's Island, with Indian Harbor on one hand and Wine Harbor on the other, and has over forty well defined leads of gold-bearing quartz, which average in width from two inches to two feet six inches, and running in parallel lines close to each other. This company has just completed a splendid crushing mill, constructed on the most approved principles, and although it has only been in operation for a short time, and they have only reached a depth of eighty feet, the returns so far from the main lead sunk upon, show an average of from one to two and one-half ounces per ton, and one of the smaller leads has given an average of three ounces and a half; and the present indications are that this is to be one of the best paying properties in Nova Scotia. It is under the able superintendence of John McQuarrie, Esq., who has been connected with the mines in this locality since their commencement; and from all that I observed during my visit to Nova Scotia I have no hesitation in saying that gold mining can and will be prosecuted there with highly satisfactory results.

Canada.

Messrs. Daniels, Scott & Taylor's Gold and Silver Reduction Works are thus described in the Madoc *Mercury* of the 16th inst.: The works are situated on the south side of the little creek which, crossing the Hastings road, separates Upper and Lower Eldorado, and flowing through the Richardson farm, falls into the Moira River a short distance below Jackson's (formerly Fox's) saw mill. The spot will be remembered as one—before the new County road was made—of the most dismal looking places in this Canada of ours; though now, rejoicing in numerous taverns and stores, it presents a much more cheerful aspect. The building—a wooden one—comprises the engine-house and crushing and amalgamating machinery; the office, and the laboratory. On entering the mill, the visitor first approaches the battery, with its two stamps, each of which, by atmospheric pressure, crushes the rock with a blow equal to three tons weight. Between the battery and the engine (14 horse-power) he notices the series of slime pits, the two large cylinders, and the amalgamating troughs; while overhead there is a tank with a capacity of more than two thousand gallons, for supplying the water needed by the engine, and for extracting the ore. The ore, after being pounded to dust by the battery, passes into the slime pits, from which it is transferred to the cylinders, in charges of two hundred weight. There it is subjected to the process of amalgamation, with the due proportion of quicksilver, and other chemical compounds; the cylinders rocking backwards and forwards slowly, while steam and cold water are alternately injected, as required, so as to bring every particle of gold the rock may contain within the searching affinity of the mercury, &c. Some idea of the practical skill and knowledge displayed in the manipulation of the ore, may be gathered from the fact that while the labor of galvanizing the amalgamating plates by the old process occupied three days, it was accomplished in these works in a few minutes. Mr. Dunstan—the experienced and practical assistant of Messrs. Scott & Taylor—has also, after repeated experiments, succeeded in devising a method of removing the accumulation of verdigris which interferes with the full action of the amalgamating plates—which arrest any particles of gold that may escape from the cylinders. In the laboratory, we were shown some interesting experiments, illustrating the wonderful effect of Wurtz Sodium Amalgam in increasing the affinity of quicksilver for the precious metals, and in clearing it of sulphur, &c. In some cases the sodium is known to have added an increase of 117 per cent. to the yield of gold. The works are now in operation day and night. In reference to the yield of ore from the "Eldorado" and Madoc Gold Mining Company, of Toronto's shafts, about which there appears to have been some dispute, Dr. Elmer reports he saw the gold, as it was taken from the retort, from one ton of the ore of the "Eldorado" mine, which is estimated to be worth from $51 to $53. In the residue of the rock (about 20 lbs.), which remained uncrushed by the stamps when the bulk of the ore from the "Madoc Gold Mining Company of Toronto's" shaft had been crushed, there was some $15 worth of coarse gold; several pieces being of the size of grains of wheat, and one as large as a pea. The remainder of the ore was in process of amalgamation, and the full result will not be known until to-morrow. There was much excitement and gratification at Eldorado.

COAL.

Pennsylvania.

WILKESBARRE, Pa., 20th Nov., 1867.

EDITORS AMERICAN JOURNAL OF MINING:

The "Pine Ridge Colliery" (Messrs. Parrish & Drake.) of this place, was to-day the scene of a very deplorable accident, by which three men here lost their lives, and several others are injured. This colliery is worked by a very fine shaft, some four hundred and twenty feet in depth; the workings are on what is known as the "Baltimore vein," and are inconsiderable, having been commenced within the year. The coal-bed at this point is composed of two "benches;" the lower one is the only one yet worked, and is from six to seven feet thick; the upper "bench" is about nine feet in thickness, and is separated from the lower by from sixteen to eighteen feet of slate. Recently work had been commenced to open this upper bench. It was found here as in the adjoining Mill Creek Colliery of the Union Coal company, exceedingly "fiery." The gas (carburetted hydrogen, $C H_2$,) was frequently ignited by the blasts. These fires being confined to an air-course driven down on the vein, were generally easily managed with water, wet cloths, &c. Sometimes, however, it was found necessary to fill the air-course with water before the fire could be got under. About a week ago this place ignited as usual, and as a hole had been driven through into a tunnel, it was impossible to drown out the fire without walling up the hole. This was neglected till too late, a change in the direction of the air-current having driven the men out. The shaft was then closed for a week, in which time it was supposed the fire would have been extinguished. On opening it the air mixed with the fire-damp in the shaft till the gas became explosive (that is, from five to fifteen parts air to one of carburetted hydrogen,) caught fire in the mine, and produced a very violent explosion, instantly killing two men and wounding several others, one of whom has since died. This first explosion was followed by some ten or twelve others at intervals of from ten to twenty-five minutes. They then ceased, and have not since been renewed. At the moment I write this letter it is some eight hours since the last. Doubtless the fire has reached the point where the principal "blowers" are situated, and the gas burns as it escapes. It is not, therefore, likely any other explosions will occur. The shaft is, of course, now open, and immense volumes of steam are issuing from it as from the crater of a slumbering volcano. There is no question about the manner in which the accident occurred, and of course the number of those that "knew it would be so" is now quite considerable—everyone, in fact, except those immediately interested; yet there is no doubt the superintendent and those in charge—very energetic and skilful men—erred solely from want of experience in such cases, and the only fault to be found is that no mining engineer was consulted. Doubtless the accident might have been prevented in many ways. First, the hole at the foot of the air-course might have been walled up: a proper use of the fan would have kept the current of air in the proper direction till this was effected; and secondly, even after the shaft was closed, carbonic acid gas might have been sent down, and would, without doubt, have proved as efficient in this case as it has in numerous others in France, Belgium and England. I understand this was even spoken of, but was not considered necessary. At present it would be more difficult of application, there being a strong current of air down and up the shaft, with much steam and water. The shaft was always "very wet," and as the workings in the mine are inconsiderable, it is rapidly filling with water; this is now probably the simplest way of extinguishing the fire. There is very little, if any, possibility of the timbering in the shaft suffering, as it is constantly wet, nor can the fire spread below in the mine; it is confined to the air-course in the upper seam, and is separated by the heavy slate parting from the other workings. The damage done, except in the loss of life, is therefore less than would be expected from the nature of the accident. The great neglect was not to consult a mining engineer whose business it is to be familiar with such cases. Unfortunately, in this part of the country it is generally supposed that a "mining engineer" is simply a "mine surveyor;" and the opinion of any of these "scientific cusses," who pretend to more than that, is not deemed of as much value as that of any "mine boss" whose whole experience has been in two or three mines, and who may know absolutely nothing of the causes which originate or the laws that govern the action of those gases which prove such deadly enemies to the miner. A mining engineer here is called in to survey the mine; but in a case like the present, or, in fact, in any important work, he is seldom consulted. This is doubtless because so many assume the name who are so totally unworthy of it that they have brought the profession into disrepute. It is as though a man were to send for a surgeon to take a thorn from his finger, and place himself in the hands of some old woman when he has a broken limb; they do not consider that a mining engineer has devoted at least as much time to the study of working safely and economically—that is, to the accidents and general health—of a mine, as the physician has to those of the "human form divine." It is high time for their own interest, as well as for the general benefit of the country, that the directors of mining companies should learn that the management of a mine should be in the hands of a mining engineer—at least as far as the working of the mine is concerned. Do we expect to get a fire engine made by a village blacksmith? or do we ask a house carpenter to design a ship of war? Then why do we expect to have mines well worked—that is, safely and economically—by managers who know as little about the matter as a blacksmith about chronometer making.

R. P. ROTHWELL, Min. Eng. and Metallurgist.

OIL.

Pennsylvania.

The Titusville *Herald*, Nov. 21st, has the subjoined oil news: Messrs. Andrews & Newton, the owners of the Mary Ann well have secured a lease adjoining the lease on which the above is located, and commenced operations on a new well.....A new well was struck last Saturday on lease No. 46, of the Foster farm, and yesterday it was produced at the rate of twenty barrels per day. The working interest of the lease is owned by John N. Palmer.....A new well was struck yesterday on lease No. 33, of the Stevenson farm. The water is not yet exhausted, but it promises to be a good paying well. It is now pumping at the rate of forty barrels per day. The working interest is owned by Mr. J. M. Newton, of Rochester. This is the fourth well on the lease.....The Bennehoff Run Petroleum company's well, No. 14, on Bennehoff run, has been drilled nine feet deeper, and is now being tested.....A new well was struck last week on lease No. 63, of the Foster farm, Pioneer run, and it is now producing about forty barrels per day. The working interest is owned by the Emery Brothers.....The well on the Foster farm, Pioneer run, owned by the Bishop Brothers, is producing two hundred barrels per day. It has not been shut down but a few hours since it was struck.....The old Empire well, on the lower McElheny farm, is to be reamed out. Operations will be commenced in a few days.....A new well was struck on Friday last on lease No. 39 of the Foster farm, Pioneer run. It is now producing fifty barrels per day. The working interest of the lease is owned by the Emery Brothers.....During the last week Roberts' torpedoes have been exploded in the Myer wells Nos. 2 and 3, in Nos. 211, 213 and 273, all located on the McClintock farm, Central Petroleum company's property. Before the explosion of the torpedoes the aggregate production of these wells was about thirty barrels per day. Since the explosion the production has come up to about two hundred and thirty barrels yer day. Most of these wells are owned by the Central Petroleum company..... A new well was recently struck on the Economite tract at Tidioute. It is owned by Fisher Brothers, of Oil City. The production is about seventy barrels per day .....The Pain well on lease No. 280 of the McClintock farm, was recently sold by the owner, Mr. W. S. Pain, for nearly two thousand dollars. At the time of the sale it was producing about seven barrels per day. Within the last six months it has produced as high as seventy barrels per day.

Coal in the Far Interior.

The very important fact is now clearly ascertained and established that mineral coal, in vast and perfectly inexhaustible quantities, exists along the eastern slope of the Rocky Mountains, from the head waters of the Missouri to the Rio Grande, and beyond it—from Montana to the western border of New Mexico. At the meeting of the members of the Academy of Natural Sciences and other gentlemen, held at their hall, on Broad street, on Tuesday evening, Nov. 12, Dr. J. L. Le Comte made some highly interesting remarks upon the coal-beds which he had examined during the past summer, in the vicinity of the route surveyed by General W. W. Wright, chief-engineer Union Pacific Railway, Eastern division, from Fort Wallace, on the Smoky Hill river, passing by Fort Lyon, on the Arkansas; thence up the Purgatory, crossing the Raton mountains; thence via Fort Union, Los Vegas, Cañon Blanco, Cañon Carnuel, and valley of the Rio Grande, to Fort Craig. The main sources of mineral fuel on this line are two: *First.* The great beds of tertiary coal which occur around the western end of the Raton mountain and the neighboring foot hills of the Rocky mountains; *second.* The beds of early cretaceous coal of the Rio Grande valley. The first coal basin consists of an immense thickness of coarse sandstones first manifesting themselves in some of the ravines of the Raton, about twenty miles east of Raton Pass, but soon becoming visible on the flanks of the mountain, continuing through the pass, and to an unknown distance west of it. This formation lies nearly horizontally against the base of the Raton and Rocky mountains, extending along the latter from the Arkansas River at Canon city to the valley of the Little Cimarron on the south. In the Raton Pass the coal beds, which are quite thin in the Manco del Burro Pass, begin to assume importance. About six miles from Trinidad, a locality on the side bank of a small stream was examined and sections drawn, which exhibit a total thickness of about five feet of good coal separated into four beds, placed near together. Other beds were found above the one examined, but no thorough exploration of them could be made. Near the top of the Pass are also beds of the same thickness, but near the southern exit of the Pass, in cañons connected with upper waters of the Canadian, here called Red river, these beds occur in still greater magnitude, being eight feet thick. All these are, however, of trifling nature compared with the great beds found in the cañons of the Vermejo valley, which showed in one locality ten feet of coal in two beds separated by ten inches of slate; the same strata were found on the other side of the cañon one half mile distant, and in other cañons several miles farther west. I was afterwards informed by Mr. Maxwell, the owner of the tract upon which these valuable mines are situated, that he has seen the same or similar beds a long distance above the point to which we traced them. Further south, other thinner beds were seen in the cañons between Vermejo and Maxwell's, of the thickness of three and four feet of good coal. Beyond the Ponejo, near Maxwell's the high table lands containing the coal beds disappear entirely, and the only sedimentary rocks in view are the early cretaceous sandstone, capped in places with middle cretaceous limestone. The thick bed of coal, which is profitably mined at Cañon city, was not visited, but the extension of the high table land of tertiary sandstone in that direction could be plainly seen; it is therefore probable that for the future necessities of the region similar beds may be found north of the Raton to those that are known south of it. The Raton Mountain lies partly in Colorado and partly in New Mexico. The 37th parallel runs directly through it. It is on the line of the Union Pacific Railway, Eastern division, about midway between Pond creek, on the Smoky Hill river, and Albuquerque, on the Rio Grande. It is a broad and irregular mass of volcanic matter, running mainly from northwest to southeast, some fifty or sixty miles. Although near to, it does not properly belong to the Rocky mountain system. There are several passes through it, one of which, the Trinchera, is suitable for a railroad, or the road may be carried round its eastern base. The Purgatoire river drains the northern slope of this mountain, and flows northeastwardly to the Arkansas; the Vermejo and Little Cimarron, on which the greatest of these coal beds are found, drain the eastern portion of the Rocky mountains south of the Raton, and unite in the Canadian river, the great southern branch of the Arkansas. The second coal basin is found in numerous exposures of somewhat inclined strata of early cretaceous age, on both sides of the Rio Grande. The beds of coal are from five feet to five and a half thick, excluding the contained slates. South of Santa Fe, near the Placer mountain, one of these beds has been overflowed by a stream of gray trachyte, and baked into an anthracite, presenting all the appearance of Pennsylvania anthracite, but somewhat less dense. These cretaceous and tertiary coals are commonly spoken of as bituminous. They are not so in reality, not softening at all when burning, and showing no disposition to coke. They burn easily, with much flame, exhaling a peculiar odor, and leaving a greater or less quantity of ash, according to the purity of the specimen. The ash is frequently quite light, resembling the ashes of wood. By slight variations in the form of the furnaces from those in use in the Eastern States, these coals can be used for all metallurgic or manufacturing purposes. In fact, coal of similar age, and frequently of far inferior quality, is extensively used in Germany. The importance of these beds of mineral fuel in the supply of our continental railroads, and in the development of the mineral wealth of the interior of the continent, cannot be overestimated. Without them, the operating of a railroad would be almost, if not quite impracticable. With them, good and sufficient supplies of fuel can be obtained at distances which will divide nearly equally the space to be passed, so that not more than 100 to 150 miles of transportation will at any place be required. Dr. Le Conte's remarks were illustrated by specimens from the different coal mines mentioned. He also stated that in the vicinity of several of the mines he examined, valuable deposits of iron ore existed. He concluded by referring briefly to the coal beds of Denver, some of which are extensively worked, for the purpose of supplying the towns in that neighborhood. One of the beds he had

visited was vertical, and 16 feet thick. Another horizontal one was 11 feet of good solid coal. Dr. Leiby then read a letter from Dr. Hayden, dated Cheyenne city, giving a brief but very interesting statement of the great coal field on the head waters of the Platte, around Cheyenne city, on the line of the Pacific Railroad of the Platte, estimated at five thousand square miles in extent. The veins are of eight to twelve feet in thickness. Dr. Le Conte traversed the more southern field for a distance of from 120 to 150 miles. The immediate fields north and south of Denver are not included in either. The specimens exhibited by Dr. Le Conte, taken from the heavier veins, very much resembled the bituminous coal of Western Pennsylvania, being compact, black, and massive. But they are different, and were formed at later periods. They are not lignites, neither are they bituminous. When first ignited they give out a clear, bright flame, but not much smoke. They do not melt at all, and therefore cannot be converted into coke; and when the volatile matter is consumed or expelled, the remainder continues to burn as anthracite or charcoal burns, until all the combustible matter is consumed, and a small residuum of earthy matter in the form of ashes is left. Messrs. Williams & Voss, analytical chemists of this city, made a careful analysis of a specimen of Raton mountain coal, with the following results:

Moisture, at 212 Fahrenheit	4.74
Sulphur	.16
Volatile matter	37.20
Fixed carbon	53.90
Ash	4.00
	100.00

This coal, it will be perceived, is remarkably free from sulphur; it is therefore admirably adapted to the smelting and working of iron, with extensive mines of which, in New Mexico, and also in Northern Colorado, it is in immediate contiguity. But of the coal in the latter locality we have seen no analysis. For the smelting of iron ore it must be used in a raw state, as is largely and successfully done with the semi-bituminous coal of the Shenango and Mahoning valleys in Western Pennsylsania and Eastern Ohio. This New Mexican coal, although not even semi-bituminous, is shown by the above analysis to contain all the constituents of a first-rate fuel.—*Philadelphia Press.*

MARKET REVIEW.

Gold and Silver Stocks.—The following transactions are reported: 100 England, $1 50; 100 do., b 5, $3; 300 do., $3 45; 500 Rocky Mountain, 23c.; 200 N. Y. & Eldorado, $1 40; 200 Quartz Hill, b.30, $1 25. The quotations are:

	Bid.	Asked.
Alameda Silver	— 25	75
American Flag	— —	7
Atlantic and Pacific	— —	1 00
Bates & Baxter Gold	— —	60
Benton Gold	— 25	45
Belcher Gold	— —	3 00
Bullion Consolidated	— —	1 00
Columbian G. & S.	— 7	11
Combination Silver	35 00	65 00
Consolidated Gregory	5 50	5 65
Corydon Gold	40	45
Eldridge Mining	3 40	3 50
Gold Hill	— —	4 00
Gunnell Gold	90	1 25
Gunnell Union	— —	50
Hale & S. bs	— —	87
Harmon G. & S. bs	— —	15 00
Holman	— —	10
Indiana Gold	— —	25
Kipp & Buell Gold	— —	40
La Grange Gold	— 35	45

	Bid.	Asked.
Liberty Gold	— —	4
Manhattan	100 00	— —
Midas Silver	— —	1 50
Montana Gold	— 15	16
New York	— 55	70
New York & Eld'o	1 40	1 50
Nye Gold	— 2	4
Owyhee Mining	— —	10 00
People's G. & S. of Cal	— —	50
Quartz Hill	1 20	1 25
Reynolds Gold	— —	3
Rocky Mountain Gold	— 20	23
Seaver Gold	— —	— —
Smith & Parmelee Gold	2 60	2 70
Sensenderfer	— —	8 00
Symonds Fork Gold	— —	1 00
Texas Gold	— 2	—
Twin Riv. Sil.	60 00	85 00
Vanderburg G.	— —	75
Yellow Jacket	— 2	— 20

Copper Stocks are quoted:

	Bid.	Asked.
Caledonia	....	10 00
Canada	....	50
Central	....	26 00
Charter Oak	....	3 00
Evergreen Bluff	....	5 00
Gardiner Hill	....	1 25

	Bid.	Asked.
Hilton	....	1 00
Indiana	....	90
Isle Royale	....	6 00
Knowlton	....	1 75
Ogima	50	....
Rockland	— —	7 00

Petroleum Stocks.—Reench'd Run sells, b.3, at $2 05.

	Bid.	Ask'd.
Bonchoff Run	....	2 05
Brevoort	....	5
Buchanan Farm	50	4
Central	60	1 10
Clinton Oil	1 25	1 50
Excelsior	....	10
Manhattan	....	15
National	....	2 70

	Bid.	Ask'd
N. Y. and Alleghany	2 40	3 50
Oceanic	....	10
Pit Hole Creek	....	90
Second National	....	....
United Pet. Farms	....	12
United States	2 00	....
Union	1 75	....

Miscellaneous Stocks.—Buffalo Marble, $9; Walkill Lead, 41@45; West. U. Tel., 33½@34; Quicksilver Mining, 15; Atlantic Mail, 119½; Pacific Mail, 127@128¾; New York Central, 114; Erie, 71½; Reading, 96⅛; Michigan Southern, 80¾; Pittsburg, 85½; Northwestern, 68½; Northwestern Pref., 87½; Rock Island, 96¼; Fort Wayne, 97⅛; Pacific Mail, 139; Adams, 79½@80; American, 76¾@77¼; United States, 76@79½; Wells, Fargo & Co., 64@64¼; Merchants' Union, 3 per cent., 59½@60.

Government Stocks.—The market for Government securities shows more steadiness. The advance of bonds in Europe to 71 has caused some buying of sixty-twos by the foreign houses, giving the market an element of strength, which it has lacked for some weeks.

U. S. 6s, 1867	140 @ —
U. S. 6s, 1881, regular	113 @ —
U. S. 6s, 1881, coupon	113 @113⅛
U. S. 6s, 5-20s, 1862, coupon	108 @108⅛
U. S. 6s, 5-20s, 1864, coupon	105⅛@105⅜
U. S. 6s, 5-20s, 1865, coupon	106 @106⅜
U. S. 6s, 5-20s, c. July, 1865	107⅜@108
U. S. 6s, 5-20s, July, 1867, coupon	107⅜@108
U. S. 10-40s, regular	100¾@101
U. S. 10-40s, coupon	102⅛@102¼
U. S. 7.30s, June, large	105⅜@105½
U. S. 7.30s, July, large	105⅜@105⅝

Foreign Exchange is dull, but rates are steady. The further decline in cotton at Liverpool has produced Irish caution respecting cotton bills, and so far adds to the local bills supply of sterling exchange; but, on the other hand, a new amount of bills against United States bonds is offered, so that bankers can afford to advance their rates. The following are the quotations for Saturday's mail:

London, (prime bankers') 60 days'	109½@109¾
London, (prime bankers') sight	109⅝@109¾
London, prime commercial	109 @109½
Paris, (bankers') long	5.17½@ 5.16¾
Paris, (bankers') short	5.15 @ 5.13¾
Antwerp	5.20 @ 5.17½
Swiss	5.20 @ 5.17½
Hamburg (bankers')	35⅝@36
Amsterdam (bankers')	40⅛@41
Frankfort (bankers')	40⅜@40⅝
Bremen (bankers')	78¾@79⅛
Berlin (bankers')	71⅞@ 72

Gold is weak at 139@139⅛. American silver is in moderate request, at 5@6 cents below the par of gold. Mexican dollars are still quoted at 102½@103 in gold.

THE SLATE TRADE.

"	green,	1st	"	"	11 50@12 50
"	"	2d	"	"	10 50@11 50
"	red,	1st	"	"	12 50@13 50
"	"	2d	"	"	11 50@12 50
Fa. blk & dk blue,		1st	"	"	10 50@11 50
"	"	2d	"	"	9 50@10 50

PRICES DELIVERED. PER SQUARE

On cars or boat at Buffalo	$11 50 per square.
Delivered at Cleveland	12 50 "
" Peyton	13 00 "
" Cincinnati	13 50 "
" Indianapolis	15 50 "
" Chicago	13 50 "
" St. Louis	14 00 "
" Louisville	14 50 "
" Detroit and Toledo	12 75 "

Intermediate, 75 cents per square less.
Red, $4 per square more.
New York Red, same as Purple.
NEW ORLEANS.—$18@20 per square.
CHARLESTON, S. C.—$15@16 per square.

THE IRON TRADE.

NEW YORK, Nov. 28, 1867.

It is very generally conceded that the Fall Iron Trade has been a failure; yet so short is the stock of American that it will all be sold before the close of navigation. The business of the week has been quiet. The market is just now principally supplied from the early purchasers, and not from the makers, who have in general but little on hand. Prices of Anthracite, Nos. 1 and 2, and of Scotch, have somewhat declined, as in our quotations. The sales of the week of Scotch Pig from ship and yard comprise from 800 to 900 tons at $38 75@40. Rails, both old and new, are flat, and unchanged in price. We notice the sale of 1,500 tons of old rails on private terms. In Manufactured Iron prices are, perhaps, easier, but there is no change.

WEEKLY STATEMENT OF NEW YORK IMPORTS.

The following table shows the quantity and value of iron imports at the New York Custom House, for the week ending and including Nov. 22, 1867:

	QUANTITY.	VALUE.
Iron, Hp., tons	$1	3.949
Iron, Pig, tons	2,016	30.426
Iron, Railroad, bars	6,357	30,755
Iron, Sheet, tons	204	10.449
Iron, other, tons	1,200	36.531
Metal Goods	128	10,301
Old metal	..	2.467
		$153,460

BOSTON IMPORTS OF PIG IRON FROM JAN. 1st TO NOV. 23, 1867.

	1867.	1866.
From Great Britain, tons	29,655	20 624
Coastwise port	8 632	15,100

Lehigh Valley Iron Trade.

The following table shows the amount of Pig Iron transported over the Lehigh Valley Railroad for the week ending Nov. 23:

From	Tons.	Total from Oct 5, 1867.
Carbon Iron Co	360	1,965
Lehigh Valley Iron Co	110	1,198
Thomas Iron Co	785	6,100
Lehigh Crane Iron Co	510	2,680
Allentown Iron Co	530	4.350
Robert Iron Co	150	1.550
Glendon Iron Co	695	3,495
Other shippers	630	200
Total	3,770	25.928

Marquette, Michigan, Iron Trade.

The following are the receipts of ore and pig iron at Marquette up to, and including Saturday, November 16, 1867, by the Marquette & Ontonagon Railroad:

IRON ORE.

	Week	Total.
Pitts. & L. Ang. Fn Co.	....	51,967
Edwards' Mine	440	4,922
Cleveland Iron Co	223	56,785
Marquette Iron Co	....	5,894
Lake Sup. Iron Co	565	107,692
New England Iron Co	....	9.408
Washington Iron Co	818	23,812
Jackson Iron Co	....	139
Ore to local furnaces	3,099	32,521
Total iron ore	4,945	273,240

PIG IRON.

	Week.	Total.
Morgan Fn Co	150	5.570
Greenwood Iron Co	136	5 362
Buncroft Iron Co	84	2,873
Collins Iron Co	88	4.460
Michigan Iron Co	....	4.128
Iron Cliffs Co	....	57
Total, pig iron	458	22,450
Total Ore and Pig	5,403	295,690

Iron and Steel Imported into the Country during the first Eight Months of 1867.

Pig Iron, tons	93,120
Bar Iron, tons	47,048
Boiler Iron, lbs	803,774
Band, Hoop and Scroll Iron, tons	10,465
Railroad Bars or Rails, tons	105,703
Sheet Iron, tons	11,174
Anchors, Cables, and Chains of all kinds, tons	4,243

Market Prices.

NEW YORK, Nov. 29, 1867.

DUTY.—Bars, 1 to 1¼c. per lb.; railroad, 60c. per 100 lbs.; boiler and plate, 1¼c. per lb.; sheet, band, hoop and scroll, 1¾ to 1¾c. per lb.; pig, $9 per ton; polished sheet, 3c. per lb. Payable in gold.

Anthracite, No. 1, best.	$41 00@43 00	6 to 12x¾ to 5-8	165 00
" " 2x, fdry,	38 00 39 00	Common Iron	
" Grey Forge,	35 00 38 00	¾ to 2 in. round and sq.	95 00
Scotch Pig, from vessel,	38 50 40 00	1 to 6 in. wide by ¾ to 1 th.	95 00
Charcoal, coal blast	50 00 67 00	1 to 6 in. wide x ⅛ to 5-16 th.	105 00
Old Wrought sc'p, fm yd.	45 00 47 00	⅛, 9-16, 5-8, 11 16, r'd & sq.	105 00
" " fm. vsl.	....	2½ to 3 inches	105 00
English rails, gold	52 50 53 00	Refined Iron.	
American " at works	78 00 80 00	¾ to 2 in. r'd and sq.	105 00
Railroad spikes	5 75	1 to 6 in. wide x ¾ to 1 th.	109 00
Old Railroad Iron	48 00@	3½ and 3½, round and sq.	115 00
Hoops, ¾ per ton	$190 00	Rods—5-8 and 11-16, round & sq., per ton	105 00
" ¾ "	160 00	½ and 9-16 round & square.	110 00
" ⅝ "	150 00	7-16, round and square	1.0 00
" 1 "	140 00	⅜ " "	125 00
" 1¼ "	137 50	5-16, " "	130 00
" 1¼ to 2 per ton	137 50	¼ " "	135 00
Scroll Iron—¾x14 per ton	180 00	3-16, " "	165 00
" 12 "	170 00	Horse Shoe Iron	127 50
" 10 "	160 00	Band—1 to 6 in. x 3-16 to No. 10	132 50
" 3-16 "	150 00	1 to 6 in. x No. 11 and 12	132 50
" ¼ "	140 00	Ovals and half Rounds.	
" ⅜x14 "	160 00	¾ to 1½	127 50
" 12 "	160 00	⅜ & 11-16,	132 50
" 10 "	150 00	½ & 9-16	137 50
" 3-16 "	140 00	Nail Rods, per lb.	
" ¼ "	155 00	"	9@10½
" ⅞x14 "	150 00	Norway Shapes	8¾c
" 12 "	150 00	Spring Steel	10¼c
" 10 "	140 00	Tire " ⅞ to ¼x¾ & 5-16	10¾c
" 3-16 "	135 00	Toe Cork Steel	10¾c
" ¼ "	132 50	Sleigh Shoe Steel	10¾c
Swed'h Pa, ord'y sizes, ⅞ to 2 in. sq., per ton	155 00	Plow Steel—6 to 14x¼ to ⅝	11c
1½x⅝ to ⅞ and ¾ in sq.	160 00		
1¼x⅝ to ⅞	165 00		

[From Boston Shipping List.]

BOSTON, Nov. 27, 1867.

Swedish—common ass'd	$150@155	Scotch Pig, No. 1	
English—com	95 100	Gartsherrie	$44@45
do refined	105 110	No. 1, other brands	41 42
do sheet, per lb	6½@ 10c	American, No. 1	40 45
Russia, sheet	16@17c		

PITTSBURGH, Nov. 23, 1867.

Pig-Iron and Blooms.—Excepting interior descriptions of forge pig which are being forced at reduced rates, the market is substantially unchanged. Stocks of raw irons in hands of consumers are light, and with a steady consumptive demand, prices of leading standard forge descriptions are well maintained.

In fine charcoal and medium grades of bituminous and anthracite coal-smelted foundry irons, but a moderate amount of business is doing.

TRANSACTIONS FOR THE LAST TWO WEEKS.

	Nov. 16	Nov. 23.
Bituminous coal, smelted	1,805	3,198
Anthracite	340	260
Charcoal	780	713
Alleghany coke	....	320
Total	2,925	4 491
Blooms	40	140

Being an increase of sales this week over last in pig-iron, 1,566 tons, and in blooms 100 tons.

ANTHRACITE.

180 tons	Gray Forge	42 00—4 mos.
50 "	Gray Forge	40 00—cash.
50 "	No. 1 Foundry	45 00—cash.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

250 tons	Mahoning Valley Mill Iron	$40 00—4 mos.
120 "	Mahoning Valley Forge	40 50—4 mos.
20 "	Mahoning Valley Foundry	46 50—4 mos.
400 "	Bituminous coal smelted from Lake Superior ore, delivered at furnace	39 00—5 mos.
200 "	Do. Close Gray, at Furnace	37 50—4 mos.
800 tons	Do. common, on private terms, deliverable at furnace.	
178 "	Do. Gray, deliverable at furnace	38 00—6 mos.
275 "	Do. Open Gray, from yard	38 50—cash.
80 "	Do. deliverable at furnace	39 00—4 mos.
70 "	Do. a favorite brand, at furnace	39 00—90 dys.
50 "	Do. Open Gray, at Furnace	38 00—60 dys.
100 "	Medium Close Gray, from yard	39 00—4 mos.
200 "	Medium Close Gray, from yard	38 00—4 mos.
200 "	Medium Close Gray, from yard	38 33—4 mos.
125 "	Close Gray, favorite brand, to arrive	40 50—5 mos.
50 "	Open Gray, favorite brand	42 00—4 mos.
40 "	Medium Forge	38 00—6 mos.
50 "	Mixture with Native Ore, Gray Forge	41 00—5 mos.
50 "	No. 1 Foundry	45 00—cash.

ALLEGHANY RIVER COKE.

820 tons	Coke	$38 00—4 mos.

CHARCOAL.

50 tons	Cold Blast	private terms.
20 "	Juniata	$50 00—cash
28 "	Juniata	50 00—4 mos.
380 "	No. 2 Charcoal Forge, choice	50 00—4 mos.
150 "	No. 1 Extra Forge	55 00—4 mos.
75 "	No. 1 Extra Forge	55 00—cash.

BLOOMS.

40 tons	Juniata	$95 00—cash.
100 "	Champlain billets, to arrive	private terms.

Iron Bars and Nails.—The iron trade is dull beyond all precedent, the iron and nail mills are only running partially, and to fill the few orders which are from time to time received. It is contemplated that a still further suspension of operations will be necessary, as there is not the remotest prospect of a revival of business in this department. The mill owners are compelled to cut everything as close as possible, and discharge their men as soon as the work gives out. It is utterly useless to attempt to manufacture stocks ahead, as it is impossible to make safe calculations for the future, owing to the present general depression, and unsettled condition of national finances. The action of Congress on the currency question, may entirely change or very materially modify the present status of affairs, and there is no sure foundation upon which to base calculations for the future. The mill owners will continue to fill all orders that may be received, but it is not improbable that a temporary suspension may occur between this time and the first of January. The appearance of things along Water and First streets, where the principal iron warehouses are located, is duller than for many years—no bustle or activity, usual at this season of the year, being apparent. The resumption of navigation on the Ohio would, no doubt, revive business for a time, but it is not expected that it would result in any permanent improvement of trade. We have no change to report in prices.

Steel.—In all branches of business coming under this head, there continues a general dulness and a gradual falling off of orders. The same condition of affairs exists all over the country and in the foreign markets. We have no change to note in prices.

(Specially reported for the AMERICAN JOURNAL OF MINING by Messrs. Addy, Hull & Co.)

CINCINNATI, November 27, 1867.

Pig.—Increased receipts are expected, and metal is offered to arrive at reduce rates. This operates to depress the market, and prices are irregular.

	Cash per ton.
Hanging Rock H. B. Mill	$43@45
" " H. B. Foundry	47 50
" " Cold Blast	56
" " Car Wheel	58
Tennesee, Cold Blast	50@51
Missouri	52 55
Jackson (stonecoal) Foundry	46 48
Blooms	105 120

Manufactured.—Market a shade firmer, with less disposition to "cut" rates.

	B	C.C.
Flat Bar	4½ to 5	5¾ to 6½
Horseshoe Iron	6 " 6½	7½ " 7¾
Heavy Band	5¼ " 5½	6¾ " 6¾
Round and Square	4½ " 8½	65¾ " 9¾
Saddle-tree	5¾ " 6½	7 " 7¾
Hoop and Light Band	5¾ " 10½	7 " 11½
Oval Iron	5 " 5¾	6½ " 7
Half Oval and Half Round	5¼ " 6	6½ " 7½
Angle Iron	6 " 7	7½ " 8¼
T and Hollow Rail Iron	6½	7¾
Saw-mill Track	6½	7¾
Sheet Iron, 10 to 17	5¾	8¾
" " 27	6¾	9¾
Boiler Plate, 3-16 to 5-16	—	7¾

LONDON, Nov. 8, 1867.

(From the London *Mining Journal.*)

Bars, Welsh in Lond.	£6 10 0@..	....	To arrive	10 2 6	10 5 0
Ditto to arrive	6 10 0	.. ....	Do. railway, Wales.	£5 0 0@£5 10 0	
Nail rods	7 0 0	7 10 0	Do, merch. Tyne or		
" Stafford in Lond.	7 10 0	8 10 0	Tees	6 10 0	.. ....
Bars	7 10 0	9 10 0	Pig, No. 1, in Clyde.	2 15 6	3 1 6
Hoop	8 10 0	9 12 6	Do. Lo.b. Tyne, Tees.	2 9 6	.. ....
Sheets, single	9 5 0	10 0 0	Do. Nos 3, 4, f.o.b. do	2 6 6	2 7 0
Pig. No. 1, in Wales.	3 15 0	4 5 0	Railway chairs	5 10 0	5 15 0
Refined metal, ditto.	4 0 0	5 0 0	" spikes	11 0 0	12 0 0
Bars, common, ditto.	5 15 0	6 0 0	Indian Charcoal Pigs		
Do. Swd. in London	10 2 6	10 5 0	in London	7 0 0	7 10 0

STEEL.

Swed. kgs, (rolled)	.14 5 0	.....	Swed. in faggots
" (ham'd)	15 00 0	15 15 0	English, spring

Swed. in faggots	16 0 0	.....	
English, spring	17 0 0	25 0 0	

Iron Items

The amount of black-band iron ore shipped over the Mill Creek Railroad for the week ending Nov. 16, 1867, was 150 11 tons; previous, 4,194 08 tons; total, 4,344 19 tons.

Mining for black-band iron ore at Pottsville, Pa., is still successfully carried on, and the ore cost nues in good demand, the shipments increasing weekly. At the McGinnes shaft, at Mill Creek, a slope is being driven directly down the vein, and apparently with good results. The shipments of black-band at present are all from this shaft and the slope of Jas. P. McGinnes & Co., east of Mill Creek.

The large and noble blast furnace belonging to the Ferry Hill and Rosedale Iron Company, at Ferry Hill, and built by Mr S. Faulkner, contractor, Coxhoe, was lit on Tuesday by Mr. Thomas, jr., son of the manager, and the blast was put on yesterday by Mr. Thomas, the manager, and Mr. Telford, assistant manager and engineer. The height of this noble structure is 105 feet, and, across the bosh, the immense diameter of 27 feet 6 inches. When full its total weight is about 2,500 tons. The stoves and all the other arrangements in connection with this monster furnace, are fitted up in a splendid manner.—[London Mining Journal.]

Messrs. Vivian, Youn ger & Bond report in the "Iron Trade Circular" of Oct. 26: As reported last week, holders of Chili Bars were firm at £70, but during the week £69 has been accepted for 100 tons, which, up to the time we write, is the only business reported in West Coast Irons; buyers generally hold off, expecting to come in for Bars at a rather lower price than £69. Transactions in English Raw are on a most limited scale. In fine Foreign, 50 tons of Wallaroo Cake, prompt two months, were done early in the week at £82. The standard for Copper Ores, at the sale in Cornwall, on Thursday last, fell £3. On the whole the market is very languid. Manufactured Copper has been sold at £79. At Redruth Ticketing, on Thursday, 1,498 tons of Ore were sold, realizing £8.818 11s. The particulars of the sale were: Average standard, £102; average produce, 8¼; average price per ton, £8 18s.; quantity of Fine Copper, 126 tons 17 cwts. Compared with last week's sale, the decline has been in the standard £3, and in the price per ton of Ore about 5s. Compared with the corresponding period of last month, the decline has been in the standard of £2 7s, and in the price per ton of Ore about 4s.

Jas. Lanigan, Esq., is sinking a slope at his furnace, in St. Clair, Pa, and is taking out some excellent ore, which some claim to be black-band, while others think it the carbonate of the coal measures. All admit, however, that it is a rich and valuable ore. Notwithstanding the many discoveries made in that region of ore so strongly resembling the McGinnes black-band that the difference is not perceptible to inexperienced persons, some people still contend that the black-band is a mere local deposit. To settle this vexed question finally, Messrs. Atkins Bros., of this place, with commendable enterprise, recently sunk a shaft at Sculpingtown, on the Saint Clair road, about one-third of a mile west of the McGinnes shaft at Mill Creek, where they struck a vein of black ore, supposed to be the McGinnes vein, eighteen inches thick, at a depth of eighty feet. The ore was analyzed, and was found to contain seventeen and a-half per cent. of metallic iron. It continued to improve, apparently, as the depth increased. Messrs. Atkins are now sinking a slope on the vein, with the determination to discover, cost what it may, whether the McGinnes black-band is merely a local deposit, or whether it actually underlies this entire region. The slope has been sunk to the depth of about forty yards, and it is their intention to sink it one hundred yards, or even further, until the truth of the matter is really made known. To do this will require from three to six months. As this is the first time that such an undertaking has been fairly commenced, the result of their investigation is awaited with intense interest, although many experienced persons have no doubt whatever that the McGinnes black-band underlies the whole of this region, and that its value can hardly be over-estimated.

THE COAL TRADE.

NEW YORK, Nov. 29, 1867.

During the fore part of the week trade was quite brisk and fair prices were obtained. The demand is entirely for the stove and smaller sizes which are held firm at our quotations. Below will be found a full report of last Wednesday's Scranton sale, showing a decline of 30 cents per ton on the average compared with their October sale. It is difficult to account for this falling off, with the close of navigation staring us in the face. Considering the slowness with which coal is being delivered by the company at Elizabeth, we are surprised that they find any purchasers at all. They require at least five to seven days to deliver a cargo of 200 tons; and boatmen of late have almost positively refused to take any orders for the port. There is evidently a screw loose somewhere. Either the company favor some special purchasers, or else they sell that which they have not got. If the former, the community will shortly lose all faith in them and refuse to give their patronage; if the latter, they are certainly damaging the trade by throwing on the market quantities of an article obviously not required. We should like an explanation: In foreign coal there is very little doing, but prices remain firm. In Provincial coals the trade has closed for the year.

The regular monthly sale of Scranton Coal took place on Wednesday after-

noon. The attendance was smaller than usual, and the bidding, comparatively with that of last month, by no means brisk. The decline in prices was general, being in lump of 3¾ cents; in steamboat, 2 cents; in grate, 4¼ cents; in egg, 30 cents; in stove, 20 cents; and in chestnut, 14¾ cents. The 60,000 tons were disposed of at the following figures:

11,000 tons	Lump	$3 50@3 75
11,000 "	Steamboat	3 95 3 80
12,000 "	Grate	3 80 4 50
5,000 "	Egg	4 00 4 70
13,000 "	Stove	5 00 5 25
8,050 "	Chestnut	3 50 4 50

Comparing with the prices of last month as follows:

9,000 tons	Lump	$3 65 @3 87½
10,000 "	Steamboat	3 87½ 3 97½
9,000 "	Grate	4 22½ 4 45
5,000 "	Egg (by one buyer)	.... 4 65
10,000 "	Stove	5 15 5 50
7,000 "	Chestnut	3 80 4 12½

The following table shows the quantity of Coal shipped over the principal roads for the week ending November 23, 1867, compared with that shipped the same time last year:

	1866.		1867.		
	WEEK.	TOTAL.	WEEK.	TOTAL.	DECREASE.
Phil. & Reading R.R.	48,173	3,414,101	58,939	3,070,071	344,030
Schuylkill Canal	30,543	1,262,114	33,825	990,563	271,551
Lehigh Val. R. R.	45,753	2,008,281	50,651	2,017,749	9,468
Lehigh Canal	42,038	1,045,811	31,679	968,089	77,727
Del & Hudson	30,250	1,250,269	26,379	1,325,226	74,957
Scranton North	9,833	393,542	13,646	452,113	58,571
Scranton South	23,111	974,991	21,705	1,122,834	147,843
Penn'a. Coal Co. Rail	19,097	442,323	16,202	762,444	320,121
" " Canal	124	24,909	117	21,169	3,740
Wyoming North	.....	97,708	.....	61,265	36,443
Wyoming South	12,882	450,944	11,388	356,234	94,710
Shamokin	17,512	517,783	11,059	440,646	77,137
Trevorton	1,410	50,468	1,498	50,700	232
Short Mountain	3,826	94,426	.....	74,786	19,640
L. V. Co	.....	.....	2,356	63,997	.....
Broad Top	.....	247,889	6,703	217,975	29,914
Williamsto'n	.....	.....	.....	.....	.....
Total	284,652	12,275,559	286,147	11,995,861	.....
1867	.....	11,995,861	.....	.....	.....
Decrease	.....	279,683	.....	.....	.....

Lehigh Coal Trade.

SHIPPED FOR THE WEEK ENDING NOVEMBER 23, 1867.

SHIPPERS.	CANAL. Week. Tons.	CANAL. Total. Tons.	RAILROAD. Week Tons.	RAILROAD. Total Tons.
FROM MAUCH CHUNK.				
Lehigh Coal & Navigation Co.	....	....	....	....
Summit Mines	11,528	348,212	....	....
Room Run Mines	....	1,313	....	....
John Laubach & Co.	....	352	....	....
Other Shippers	....	....	....	....
Total	11,528	349,878	....	....
FROM B. M. REGION.				
ohn Connery	....	....	....	1,534
W. T. Carter & Co. (Coleraine)	655	14,352	1,707	80,660
Spring Mountain Coal Co.	638	8,530	2,768	123,966
Thomas Hull & Co. (N. Y. & Lehigh Co)	571	12,594	2,019	92,193
Honey Brook Coal Co.	1,919	44,888	2 418	123,455
German Pennsylvania Coal Co.	585	11,018	676	36,140
Beaver Meadow (D. W.)	....	....	....	1,733
Other Shippers	....	....	10	218
Total	4,390	91,384	9,601	460,642
FROM MAHANOY REGION.				
McNeal Coal and Iron Co	98	5,279	2,604	90,957
Knickerbocker Anthr. Coal Co.	....	1,682	1,522	51,211
North Mahany Mines (Mahanoy Col. now B. & C.)	....	1,578	293	14,575
Delano do	....	1,140	....	38,872
Primrose Mines (Rathbun, Stearns & Co.)	....	....	904	28,563
Walter, Brothers & Co. (now Bedford & Cox)	....	82	....	....
Mount Etna Coal Co.	289	3,975	81	2,127
Trenton Coal Co.	....	184	....	1,609
Glendon Coal Co. (Glendon Colliery)	....	93	671	16 530
Thomas Coal Co.	98	1,775	1,142	31,173
Williams & Herring	....	189	97	10,635
E. S Silliman	....	....	2,454	98,509
East Boston	....	....	....	505
New Boston Coal Co.	95	479	337	26,832
Shamokin Coal Co.	....	....	....	4,202
Caledonia M. & M.	....	....	419	2,000
Other Shippers	....	....	....	122
Total	582	16,380	10,530	413,129
FROM HAZLETON REGION.				
A. Pardee & Co. (Hazleton)	1 472	71,005	3,542	134,945
G. B. Markle & Co. (Jeddo)	1,713	52,709	2,804	111,310
Wm. S. Halsey & Co. (Mt. Pleasant)	250	5,482	343	10,884
Buck Mountain Coal Co.	1,202	42,675	1,951	55,101
Sharpe, Weiss & Co. (Council Ridge)	1 215	33,600	1,511	71,660
Coxe, Brothers & Co. (Cross Creek)	560	12,496	424	17,756
Ebervale Coal Co	1,144	37 074	1,650	61,477
Stout Coal Co.	388	21.193	768	29,843
Harleigh Coal Co.	891	23,260	1,054	39,760
Ashburton Coal Co.	....	1,582	....	432
East Sugar Loaf	....	....	2,940	135,281
Upper Lehigh C. Co.	802	15,364	1,896	52,667
Highland	669	10,568	1,026	23.246
Mount Hall	....	180	....	1,194
Woodside	481	1 046	....	1,723
Latimer	70	788	239	3,551
Other Shippers	....	....	....	10
Total	10,891	336,195	20,245	751,248
FROM WYOMING REGION.				
Newport Coal Co.	....	3,533	....	783
Warrior Run Mining Co.	....	2,148	833	12.961
Parish & Thomas	162	11,925	958	42.910
New Jersey Coal Co.	520	8,390	333	15,470
Lehigh & Susquehanna Coal Co.	....	2,933	....	11.245
Germania Coal Co.	279	8.554	143	12,654
Franklin Coal Co	....	5.507	....	8,763
Audenried Impr'v't & Coal Co.	187	9.123	....	7,788
Valley Coal Co.	....	189	....	384
Wilkes Barre Coal and Iron Co.	2,137	77,915	334	55.907
Baltimore Coal Co.	401	16.524	....	30.186
Union Coal Co	....	5,223	417	9,773
Wyoming Coal & Transp'n Co.	87	7,259	229	18,949
Everhart Coal Co	....	2,618	....	1,904
Morris & Essex Mutual	....	....	....	7,497
H. B. Hillman & Co	....	....	73	7,140
Bowkley, Price & Co.	....	....	....	1,745
T. F. Hunt & Co	....	....	....	774
John Horton	....	473	....	....
Mineral Springs	....	....	....	4,501
Consumers	....	....	151	1,627
Plymouth Coal Co.	....	....	1,408	10.327
Enterprise Colliery, J. H. Sweyer	....	90	461	2 264
Washington Coal Co.	....	....	316	1,640
West Pittston	....	....	....	99
Shawnee	93	184	70	211
Other Shippers	417	11.747	....	....
Total	4.289	174,243	5,737	267,315
Grand Total	31,679	968,089	46,114	1 892,635
Total 1866	42,038	1,045,811	35,648	1,706,640
Decrease	10,358	77.727	....	....
Increase	....	....	10,466	185,995

Cumberland Coal Trade.

For the week ending Nov. 24, 1867.
From the Alleganian.

COAL TRADE BY RAILROAD.—Statement of Coal shipments over the Baltimore and Ohio Railroad for the week ending Nov. 24, 1867:

From C. and P. R. R.	Tons.
Consolidation	1,582.06
American Company	669 05
Borden	594 07
New Hope	32 07
Midland	22 16
Hampshire	.....
From Eckart R. R.	Tons.
C. C. and I. C.	501 14
Spruce Hill	.....
Black Avon	.....
Total	3,402 15

From George's Creek via Piedmont.		Tons.
George's C. & I. Company		396 13
Central	do	1,563 19
Atlantic	do	688 11
Piedmont	do	957 17
Swanton	do	948 16
Barton	do	1,049 05
Potomac	do	1,242 11
George's C M	do	1,566.17
Franklin	do	1,254.15
Hampshire	do	2,404 03
American		1,855 18
Total		13,928 05

By C. & O. CANAL.—There were dispatched from the port of Cumberland, during the last week, boats laden with 9,503 05 tons of coal, forwarded by the following companies:

American	4,116 08
Central	4,077 02
Hampshire & Baltimore	1,509 15
Total	11,232 11

Coal transported over the Cumberland & Pennsylvania Railroad, during the week ending November 16th, and for year:

	To Canal.	To B. & O. R. R.
For week	10,291 06	16,854 15
For year	357,897 10	528,638 00

During the corresponding period of 1866, there were delivered to the Baltimore & Ohio Railroad 526,481 19 tons, and to the Chesapeake & Ohio Canal 266,270 17 tons.

Schuylkill Coal Trade.

BY RAILROAD & CANAL, FOR WEEK ENDING NOV. 23, 1867.

	Railroad.	Canal.
St. Clair	31,229	.....
Port Carbon	6,741	.....
Pottsville	776	.....
Schuylkill Haven	13,700	.....
Auburn	2,220	.....
Port Clinton	4,173	.....
Total for week	58,939	33,825
Previously this year	3,011,132	956,738
Total	3,070,071	990,563

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

At New York, November 29, 1867.

Schuylkill R. A., choice	$5 75@$6 00		Lehigh Broken	5 25	....
" Ordinary	5 25	5 50	" Egg	5 25	....
" W. A., Lump	5 25	5 50	" Stove	5 50	....
" Steamboat	....	5 25	" Chestnut	4 20	....
" Broken	....	....	Wilkesbarre Lump	5 25	....
" Egg	....	....	" 'Ren & Egg	5 25	....
" Stove	5 50	5 75	" Stove	5 50	....
" Chestnut	4 00	4 25	" Chestnut	4 75	....
Lehigh White Ash Lump	5 37	....			

SPECIAL COALS.—DEALERS' QUOTATIONS.

Diam'd Vein R. A., Sch'kill	....	....	H. Hoils, E. S'klin, Lorb.	5 50	....
Locust Dale W. A.	....	....	New England Red Ash	$5 25	....
Honey Brook " Lehigh	5 50	....	Broad Mountain	5 25	....
Harleigh " "	5 50	....	Wyoming	5 00	....
Spring M'n " "	5 50	....	McNeal Co	5 50	....
Sugar Creek " "	5 50	....	Locust Mount'n (Repplier)	550	....
Ashburton " "	5 50	....	Duncan Red Ash "	6 00	....
Fulton White Ash	5 50	....	W'barre Coal & Iron Co	5 25	....
Stout	5 50	....	New Burgh Orrell Gas Coal	9 00	....
Old Co's " "	5 50	....	Despard Gas Coal	9 00	....
Back Ridge W. A., Sh'kin	5 00	....			

Dealers in these Coals may be found in our advertising columns.

At Philadelphia, November 29, 1867.

Lehigh Lump and St'mb't	$5 00@....		Schuylkil Chestnut	2 75	....
" Broken and Egg	5 00	....	Locust Mount Lump and Steamboat	4 25	....
" Stove	5 00	....	" Broken	4 25	....
" Chestnut	3 75	....	" Prepared	4 25	....
Schuylkill R. A. Prepared	4 25	4 50	" Chestnut	2 87	....
" Chestnut	2 75	....	Lorberry Coal	4 25	....
" W. A. Lump and Steamboat	4 25	....	Shamokin	4 75	....
" Broken	4 25	....	Franklin. (Lykens Valley)	4 75	....
" Egg and Stove	4 25	..	Broad Top	4 75	....

Scranton Coal at Elizabethport, November 29, 1867.

(Corrected weekly by D. L. & W. R. R. Co.)

Lump	$4 25@....		Egg	5 00	....
Steamer	4 50	....	Stove	5 50	....
Grate	4 75	....	Chestnut	4 40	....

Prices for Pittston Coal at Newburgh, November 29, 1867.

(Corrected weekly by Penna. Coal Co.)

Lump, per ton of 2240 lbs.	$4 70@....		Egg " " "	4 70	....
Steamer, " " "	4 70	....	Stove " " "	4 90	....
Grate " " "	4 70	....	Chestnut " " "	4 20	....

70 cents additional to New York.

Lackawanna at Rondout, November 29, 1867.

(Average contract prices for year.)

Lump	$4 90@....		Stove	5 45@....	
Steamer	5 00@....		Chestnut	4 50@....	
Grate	5 20@....		Pea	4 20@....	
Egg	5 30@....				

Lehigh Coal at Elizabethport, November 29, 1867.

Lump	5 50@....		Chestnut	4 50	....
Steamboat and Brokene	5 25	....	Stove	5 50	....
Egg	5 25	....			

At Baltimore, November 29, 1867.

Wilkesbarre & Pittston W. A. by cargo or car	$5 50@5 75	From wharf or yard, 75c. to $1 per ton additional.	
Lykens Valley R. A. by cargo or car	5 75@ 6 25	Retail, deliv'd, per 2,240 lbs	7 00@7 75
Sunbury & Shamokin R. or W. A. by cargo	5 50 5 75	George's C'k and Cumberland f. o. b. at Locust P't for shipping	4 85@5 00

At Havre de Grace, Md.

Wilkesbarre or Pittston, W. A., on board	$4 85@5 10	Sunbury or Shamokin, R. or W. A., on board	....@5 25
		Lykens V'y, R. A. on b'd.	5 60@5 85

At Georgetown, D. C.

George's Creek and Cumberland on board ..... $4 25@ 4 50

Wilkesbarre Coal at Elizabethport, November 29, 1867.

(Corrected by Wilkesbarre Coal & Iron Co.)

Lump	$4 70	....	Egg	5 00	....
Steamer	4 50	....	Stove	5 25	....
Broken	4 75	....	Chestnut	4 50	....

Ten cents additional on shipments from Jersey City.

Prices of Provincial Coals.

[CORRECTED WEEKLY BY LOUIS J. BELLONI, JR., 43 PINE STREET.]

Duty $1.25 per ton.

Block House (on board)	$2 00 gold		Little Glace Bay "	1 87½ "	
Gowrie "	1 75 "		International Co.'s "	1 75 "	
Lingan "	1 75 "		Slack Coal, B. H., "	75 "	
Sydney "	2 25 "		" L. G. B.,	1 00 "	
Picton "	2 25 "				

Prices of Foreign Coals.

Duty $1.25 per ton.

Corrected weekly by PARMELEE BROS., 32 Pine Street, N. Y.

Liverpool Gas Caking	$11 00	Liverpool House Cannel	19 00@20 00
" " Cannel	14 00	" " Orrel	16 00@18 00

Per ton 2240 lbs., Ex. ship.

PRICES FROM YARD

Liverpool Orrel, screened	$18@20	Liverpool Cannel, scr'd	22 00@— —

per ton 2000 lbs. delivered.

Coal Freights.

(Corrected Weekly.)

From Elizabethport.

Albany	$ 90@— —		New London	1 25@— —	
Boston	1 75	— —	Newport	1 40	— —
Bridgeport	1 00	— —	New York	55	60
Fall River	1 40	— —	Norwalk	1 00	— —
Hartford	1 50	— —	Norwich	1 30	— —
Hudson	1 00	— —	Pawtucket and towing	1 50	— —
Lynn	— —	— —	Portland	1 60	— —
Middletown	1 25	— —	Portsmouth	2 15	— —
New Bedford	1 45	— —	Providence	1 40	— —
Newburyport	2 00	— —	Salem	1 80	— —
New Haven	1 00	— —	Taunton	1 40	— —

From Newburgh.

RIVER.	CO.'S BOATS.	EASTERN.
Albany	50@....	Boston 1 75@....
Barrytown	35	Bridgeport 1 12½....
Catskill	35	Bristol 1 50 ....
Cold Spring	30	Dighton 1 50 ....
Coeymans	45	Fall River 1 45 ....
Coxsackie	40	Mystic 1 30 ....
Fishkill Landing	20	New Haven 1 12½....
Greenbush	50	New London 1 25 ....
Haverstraw	45	Newport 1 45 ....
Hudson	35	Norwalk 1 12½....
New York	70	Norwich 1 40 ....
Nyack	50	Pawtucket 1 65 ....
Peekskill	40	Providence 1 50 ....
Poughkeepsie	25	Stamford 1 12½....
Rhinebeck	30	Stonington 1 25 ....
Saugerties	35	Warren 1 45 ....
Sing Sing	50	
Stuyvesant	40	
Tarrytown	50	
Troy	55	
West Point	30	
West Troy	55	
Yonkers	55	

From Port Richmond, Philadelphia.

Boston	2 60	2 75	New London	2 00	— —
Bath	2 75	— —	New Orleans	4 50	— —
Bramtree	2 90	— —	Norwich	1 95	— —
Conassett Narrows	2 85	— —	Newport	2 00	— —
Fall River	2 00	— —	New Belford	2 00	— —
Hartford	2 35	— —	Pawtucket	2 05	— —
Lynn	2 25	— —	Providence	2 00	— —
Norwalk	1 80	— —	Sing Sing	1 45	— —
New York	1 40	— —	Wareham	2 54	— —
New Haven	1 85	— —			

From Rondout.

Boston	$2 00	New London	1 40
Bridgeport	1 25	Newport	1 60
Bristol	1 60	Norwalk	1 25
Dighton	1 55	Pawtucket	1 70
Fall River	1 60	Providence	1 60
Mystic	1 40	Salem	2 00
New Haven	1 75	Stamford	1 25
Norwich	1 50	Stonington	1 40

From Baltimore.

To Philadelphia	$1 40@— —	Boston	2 25@ 2 50
New York	2 10 — —	Sound Ports	2 25@ 2 50
Washington	1 10 — —	Norfolk	1 00@— —
Annapolis	75 — —	Richmond	1 30@— —

From Washington, N. J.

Hackettstown	$ 58	Iron Dale	$ 1 19
Waterloo	81	Dover	1 24
Stanhope	90	Paterson	1 80
Port Morris	99	Pompton	80
Rockaway	1 32	Bloomfield	1 60
Denville	1 33	Newark	2 00
Boynton	1 44	Belleville	2 10
Little Falls	1 70	Communipaw	2 10
Drakesville	1 08	Jersey City	2 20
Dickerson's Basin	1 11	New York	2 20

From Georgetown or Alexandria.

To Philadelphia	$1 50 — —	Boston	2 75 2 50
New York	2 15 — —	Sound Ports	2 25 2 50

Provincial Freights.

	Currency.
Sydney to N. Y.	$2 75
Sydney to Boston	2 75
Lingan	3 50
Lingan to Boston	3 00
Cow Bay	2 75
Cow Bay to Boston	2 75
Cow Bay to Portland	2 50
Big Glace Bay	3 87
Little "	2 50

Foreign Freights.

New Castle and Ports on Tyne	£26 keel.
Liverpool	15@17s. keel.

Rates of Transportation to Tide Water, June 1, 1867.

PHILADELPHIA & READING RAILROAD.

From Pottsville to Philadelphia	$2 17
" " Port Richmond	2 07
" " New York, drawback off	2 80

SCHUYLKILL NAVIGATION.

From Pottsville to Philadelphia	2 08
" " New York, drawback off	2 88

Wyoming Valley Canal.

	Tolls.	Freights.
From Wilkesbarre to Havre de Grace	97c.	$1 55
" " Columbia	69	1 20
" " Middletown	67	1 10
" " Harrisburg	65½	1 05

OTHER AVENUES.

From Mauch Chunk to Philadelphia, Canal, including unloading		1 88
" " Philadelphia, via North Penna Railroad		2 00
" " Elizabethport, via N. J. Central Railroad		2 63
" " Port Johnson		2 10
" " New York		2 47
" " New York via Del. Div. and Raritan Canal, including unloading		2 67
" " New York via Morris Canal		2 39
" " Hoboken via Morris & Essex Railroad		2 10
" " New York		2 29
From Elizabethport to Buffalo, via New York Canal, a distance of about 459 miles—freight, $2 62, toll 78 cents		3 40

The shipping expenses at Elizabethport and Port Johnson vary from 25 to 30 cents.

BOSTON STOCK MARKET.

BOSTON, November 21, 1867.

Prices of mining stocks bid this day were as follows:

Allouez	2	Huron	—
Calumet	—	Isle Royal	—
Hecla	34	Minnesota	—
Canada	—	Quincy	18
Copper Falls	25¾	Cary Improvement	7
Franklin	14	Rockland	—
Hancock	—	Boston Water Power	17

Sales at Boston Stock Exchange, November 20.

100 shares	Water Power	17½	100 shares	Hancock	14
400 do	Concord	3	100 do	do	b.10 14
100 do	do	b.30 3½	300 do	do	15¾
100 do	do	s.30 3	50 do	do	14
100 do	do	b.60 3½	100 do	do	b.30 14¼
200 do	do	s.60 3¾	200 do	do	b.30 14½
60 do	Phœnix	1	100 do	do	13¾

London Weekly Metal Report.

LONDON, November 15, 1867.

The amount of business transacted in the Metal Market has been small since our last report; prices have been fairly maintained, and it seems as if they cannot well go lower.

IRON.—The reports from Staffordshire and Wales show no signs of an improved demand; prices for finished iron are unaltered. A large business has been done in Scotch pig-iron, but the price has declined to 54s. buyers.

COPPER.—Nothing new to report. The smelters are asking full prices for tough and selected, but are disposed to book orders for manufacture at a slight concession. Tough cake and ingots nominally £75 to £76. Burra, £83; Wallaroo, £81. Chili bars, in Liverpool, have advanced to £69.

TIN has mainted its value. Fine Straits, £90; Banca, £92. 10s. to £93. English tin steady. The Dutch market is firm at 53⅛f.

TIN PLATES continue neglected, and prices irregular.

LEAD shows no signs of improvement. Good soft English pig £19. 5. to £19 7s. 6d.; LB, £19. 18s.

SPELTER has maintained its position; an exceptional transaction having been reported at £21. 12s. 6d. ex ship, but parcels in warehouse are obtainable at £21. 16s. Special brands in outports £21. 16s. 6d., to £22.; WH. £22. 5.; V and S. £21. 12s. 6. Belgian spelter, £22. 5.

Coal Items.

The consular agent for France, at Formosa, has reported the existence of bearings of coal at Ponghou, the principal island of the Pescadores group, between Formosa and the coast of China. The island of Ponghou possesses a port named Nahung, with a good roadstead for all weathers, even in case of typhoons. The only coal bearing yet discovered, exists at the northern extremity of the island, but it is considered probable that coal will be found in all the subsoil as well as in the other islands of the same group. No explorations have yet been permitted by the Chinese, so that the coal found has at present been only obtained from the surface of the soil, where it is of somewhat inferior quality. The soil of Ponghou also contains iron minerals

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☞ Correspondents, exchanges and others addressing us should be *extremely careful* to write "JOURNAL OF MINING," instead of "MINING JOURNAL," to ensure safe carriage. Communications intended for publication should be plainly written, and on one side of the paper only.

NEW YORK, SATURDAY, NOVEMBER 30.

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SCIENCE AND THE BIBLE.

The *Examiner and Chronicle*, a religious newspaper of this city, and the principal organ of the Baptist denomination, contains a well-written review of the geological argument of Dr. CURTIS, in his recent work on the "*Human Element in the Inspiration of the Scriptures*"—an argument which is based on the alleged blunders of the writer of the first chapters of Genesis, and attempts to prove that these chapters are therefore not inspired, in any such sense as would make them correct. The reviewer ably refutes, in detail, some of Dr. CURTIS' objections; but the strongest point in his reply is the following passage:

"Since Geology began to urge its claims to be recognized as a science (it can hardly yet be considered an absolute one) there have been three classes of geologists engaged in the discussion of its problems: the first, men of skeptical and theorizing tendencies, generally not ranking among the ablest and most profound of their school, who have made haste to use every discovery, or supposed discovery in Geology, as a new weapon against Christianity and the Word of God; a second class, devout Christians, but like the first, not generally profoundly versed in the science, who were constantly fearful lest injury should come to the truth of God by the revelations of Geology, and were ever on the alert to apologize, to reconcile, or to explain the apparent discords between the new science and the Scriptures. A third class, more eminent, for the the most part, than either of the others in their scientific attainments, recognized no such discrepancies. They regarded the Scripture record as not intended to be a scientific text-book, and while satisfied that, in the rare instances in which it crossed the path of any science, it would be found to have stated facts, and not falsehoods, they were contented to wait for greater perfection in geological science, and more marked evidence of an irreconcilable difference, before deciding against the Word of God.

To the first of these classes belonged Oken, Strauss, Page, Robert Chambers, and the development-theory men generally, no one of them remarkable for his profound research as a geologist. In the second class were found Dr. John Pye Smith, Hugh Miller, and several of our American geologists. In the third class were such men as the late Dean Buckland, Dr. Mantell, Sir Roderick I Murchison, the late William C. Redfield, Rev. Dr. Edward Hitchcock, Professor Silliman, senior, and his son, and till lately, we might have added Prof. Lyell. These were the great men in geological science, and it is fair to say that with none of them had the explanations and attempted reconciliations of Hugh Miller, highly esteemed as a geologist though he was, or of Dr. J. Pye Smith, any weight.

So far as the Mosaic account of the creation was concerned, their view has always been, that it had no necessary connection with Geology at all."

The omission of the name of Prof. DANA, whose chapter on Cosmogony is one of the most able and interesting in his manual of Geology, seems to indicate that the reviewer is scarcely posted in the mere modern researches of geology; and this suspicion is confirmed by the style in which, notwithstanding the good sense of his general position, he attempts to explain the Bible account in the light of science. We think he repeats the mistake of Hugh Miller, in advancing prematurely a plan of reconciling two revelations, neither of which is yet fully understood. Our meaning will be more apparent in the sequel. We quote the reviewer's geological explanation of the Flood, which, he argues, comprised Western and perhaps a part of Central Asia, Southeastern Europe and Northern Africa.

"Dr. Curtis can hardly be ignorant of the fact, that geologists are generally agreed that the Australian Continent has been elevated above the ocean level within the last four thousand years, and that its upheaval was a sufficient cause for the throwing of a vast tidal wave over Western and Central Asia and the land bordering on the Mediterranean: and how could such an upheaval be more graphically described than it is by the sacred writer, in the phrase, "and all the fountains of the great deep were broken up."

The date of the upheaval of Australia is not by any means so fixed as is here asserted: and the students of Bible chronology are considerably in doubt as to the date of the Flood. The notion of a sudden upheaval, at any period, of such a continent, producing a gigantic wave, to overwhelm another continent, violates all analogies, and is one of those crude, cataclysmic theories which modern geology rejects. We do not believe in great continental "convulsions," especially not in the alluvial period, or "within four thousand years." Besides, the Bible rejects this explanation as distinctly as Science, and ascribes the submersion of the inhabited world to a deluge of *rain*. The Australian theory won't do.

The difficulty in the way of such harmonists is two-fold. In the first place, we do not know what the Bible account really means. Moses nowhere claims for his story a literal, historical inspiration. The wisest scholars are disputing still as to the dates and numbers in the books of Old Testament history. It is a mockery of the Scriptures to confound their authority with human interpretations and prejudices, and by undertaking to defend untenable ground, to bring the discredit of defeat upon the Bible. In the second place, we do not know what science proves. Geologists unsay to-day what they said yesterday. It is always possible to find some words of eminent men, going to support a particular view of the Bible history; but the church no sooner with reluctance accepts the new platform, as a compromise, than it is knocked away from under her feet, and the very means adopted for her defence are turned to weapons of ridicule against her. Thus when fossil shells were first collected on the mountains, in the middle ages, they were considered proofs positive of the Noachian Deluge; the doctrine of a central fire molten mass in the Earth has been pressed into the support of the doctrines of the torment of the wicked, and the final conflagration of the globe: and a dozen different scientific discoveries have been hastily seized upon to fit the Mosaic cosmogony to the advancing knowledge of mankind.

What is then the duty of those who believe and love the Bible? Simply, to abandon the notion that it is a scientific text-book; to await fearlessly the final results of thorough investigation, and, if they are the followers of science, to pursue the truth without any reference whatever, hostile or otherwise to the supposed statements of Scripture; to base their faith in the Bible or something more certain than the upshot of the current debates on Genesis; and to cultivate a piety which will be able to survive the shock it may possibly have to encounter, of finding that Adam was not the first man, or that Eden is an allegory only. We once heard a Millerite preacher say, that if the world did not come to an end the next April, "there was no truth in the Bible." Let intelligent Christians avoid such blasphemy, and not stake the truth of their religion on the result of any conflict of criticism.

There is but one important dogma in danger, and that is the orthodox dogma of original sin. Some of the doctors seem to think that the little verse

In Adam's fall
We sinned all.

were to lose its first line, the world could deny the truth of the second. But this is to be anxious about the strongest point of all the creeds. There is nothing so well proved as universal sin; and the proofs, alas! are multiplying with the population of the world. Adam is not needed to build that faith upon. These desperate attempts to save unessential doctrines of the church impress us like sallies out of the gate of a beleaguered castle, while the enemy pours over the walls.

The flippant infidelity of some geologists, so much to be regretted, is partly the result of such tactics on the part of the church. Let both parties agree that their notions on these points are to be, not bitterly attacked or obstinately defended, but calmly, thoroughly and freely investigated; let anathemas cease on one side and sneers will cease on the other. Both religion and science will be the gainers by such a temper.

IRON AND COAL IN COLORADO.

Our readers will recollect a description of the coal and iron deposits of Boulder Co., Colorado, by our esteemed correspondent, A. WOLTERS, Esq., of Central City, which was published Oct. 19th, in this Journal. These deposits, we are glad to know, are about to be energetically developed with the aid of Eastern capital; and the Belle Monte Furnace Iron and Coal Company, the statement of which will be found in another column, is understood to control all the coal and mining ground of that locality.

Concerning the coal, there is no doubt of its abundance, quality, or commercial value. The letter of Dr. F. N. HAYDEN, geologist for the State of Nebraska, is so clear and convincing on this head, that we prefer to insert it as the best statement of the facts which can be given.

BELLE MONTE FURNACE, BOULDER COUNTY, COLORADO, October 28th, 1867.

J. M. MARSHALL, Esq.:

Dear Sir—I have examined with a good deal of care the coal deposits at this locality, and I cannot speak too highly of their value. I agree with you that there are at least from eight to eleven beds of coal from five to thirteen feet in thickness, making an aggregate thickness of from thirty to fifty feet of solid coal at least. *It will be seen at once that the supply must be inexhaustible.*

As to the age of the coal beds, there can be no doubt that they belong to the tertiary period, and the coal is of the lignite variety. It is non-bituminous, and holds a position between dry wood and the anthracites of Pennsylvania. It burns with a bright red flame, gives out an abundant supply of heat, and leaves very little ash. Indeed the analysis made by Dr. Torrey, Assayer of the United States Mint at New York, shows that it contains only two per cent. of ash, and fifty-eight per cent. of fixed carbon. *For generating steam in every way it must prove eminently successful, and there is no reason to suppose that it will not be useful for smelting ores.* For all domestic purposes it must ever rank next anthracite. It is almost as neat as dry wood, gives no offensive odor, contains no destructive element whatever, indeed there is nothing in it that will injure steam boilers, stoves or furnaces, more than dry wood. The vast geographical area which must at some time be supplied with fuel from this region renders these coal deposits, in my opinion, of national importance. As United States Geologist for the State of Nebraska, I have convinced myself, after a thorough search, *that there are no workable beds of coal in the State. Not more than one-fourth of the State of Kansas contains workable beds of coal.* It will be seen then, that not only Colorado, but also Nebraska, and Kansas, at no distant day will be supplied with coal from this district. *I am certain that for all domestic purposes these lignites are preferable to any of the bituminous coals in the United States west of the State of Pennsylvania.*

When the Union Pacific Railroad, and the Pacific Railroad, Eastern Division, with their numerous branches, are completed, millions of tons of this beautiful fuel will be distributed over this vast area, which is now almost or entirely destitute of both wood and coal. When this coal has been tried along the river towns of Nebraska, and especially at Omaha, I think I may safely say, that within three years from this time the last ton of bituminous coal will have crossed the Missouri River from the eastward. The cars on the great Pacific routes will be freighted mostly from the East to the West, and will return almost empty. It will, therefore, become an easy matter to transport this fuel to almost any point between the foot of the Rocky Mountains and the Missouri River.

As to the iron ores of this locality, *these, too, seem to be inexhaustible.* They occur in the form of nodules or concretions of all sizes, from a pound to several tons weight. These concretions are scattered through 1,200 to 1,500 feet of strata.

I have, within the past fifteen years, explored the greater part of Nebraska, Kansas, Colorado, Dakota, Montana, Idaho, and small portions of contiguous territories, and I can conscientiously say, that for coal and iron, I HAVE NEVER MET WITH SO RICH A LOCALITY AS THIS WEST OF THE MISSISSIPPI. I believe that the future prosperity of Colorado, Nebraska and Dakota depends more upon the successful development of these vast coal and iron deposits than upon any other one thing. Very respectfully,

F. V. HAYDEN,
U. S. Geologist for Nebraska State.

As regards the iron, we are not so confident. It is true, according to a great accumulation of unquestioned evidence, that there are large quantities of superficial boulders scattered over the ground all the way from South Boulder to Coal Creek; but there is no proof as yet of the existence of a continuous deposit. Such accumulations of nodule-segregations of iron are not uncommon in the carboniferous regions of West Virginia; but they do not always afford ground for permanent workings. How DR. HAYDEN found out that these nodules extend through 1,200 to 1,500 feet of strata, we confess ourselves unable to explain. However, there is undeniably a great supply of the surface boulders easily accessible—enough to run a blast furnace for years—and an iron manufacturing enterprise in Colorado ought to pay for itself over and over again, before the material known to exist has been exhausted.

The importance of this enterprise to the welfare and especially to the mining industry of Colorado, cannot be over-estimated. We look to see the great metallurgical establishments gathered in the neighborhood of the coal deposits, and administered by proprietors, distinct from the miners, and purchasing ores of the latter at fair rates. Only by such a division of labor and responsibility can the work of both departments be thoroughly done. To the coal and iron mines, therefore, all other industries in Colorado will pay ample and willing tribute.

According to present appearances, this enterprise will be a practical monopoly. For the sake of the country we should be glad to see other mines of this character opened along the lines of the Pacific Railroads; but the gentlemen who own the mines of Boulder Co. may perhaps be excused for rejoicing that their power over a large and growing market is so nearly absolute.

We do not know what are the precise financial features of this plan, nor how it will be administered. If we shall hereafter see reason for fault-finding, our criticisms will be all the more severe, because we believe in the immense value of the property to its owners and to the country; and we should be indignant to see interests of such magnitude dealt with in anything but a straight-forward, sagacious, business-like spirit.

THE MANHATTAN METALLURGICAL WORKS.

There are many thousand tons of ore shipped from North and South America to Europe, for metallurgical treatment, which might as well be beneficiated in New York, if we had the proper facilities for the work. We have long believed that the establishment of large smelting works in or near this city would be advantageous to the mining interests in general, as well as the parties to the enterprise. It is true, there are one or two places where certain ores can be treated, and there is at least one establishment—that of BALBACH & DIEFENBACH, in Newark, conducted with intelligence and success. But we are justified, on the whole, in pronouncing the Manhattan Metallurgical and Chemical Works, of Messrs. SECOR & SWAN, in West Twenty-eight street, the only undertaking which promises to supply the lack so long felt, and furnish a convenient and well-managed smelting-work in this neighborhood, where ores may be thoroughly tested in considerable quantities, and, if occasion serves, reduced, on a large scale, on joint account with the miner, or at a given rate per ton.

Of course no ores will be likely to come far by land transportation for regular treatment here. It is such ores as can be readily shipped to this port by sea which would naturally constitute the regular supply of works located in New York. Some of the Southern auriferous sulphurets; Mexican silver ores; copper, silver and gold ores from South America, or even from the Pacific coast, or the splendid mines now being developed on the Colorado river; material from any quarter

which is found refractory, and requires to be treated with better skill than is available in the locality, or to be mixed with other ores or fluxes, not there to be found;—these are the sources from which the Manhattan Works may expect to draw abundant supplies. But, although the reduction of large quantities of ore may form the most profitable part of their business, we are more interested in the facilities they offer for working tests of different ores. In spite of the sad disappointments which have attended many hasty investments of New York capital in mining, there will be, and there is already, a steady increase in the amount of capital interested in that branch of enterprise; and New York will continue to be the headquarters of many mining companies, the operations of which are scattered over the whole country. Hitherto, the managers of these companies have been at the mercy of their agents at the mines and of scatter-brained and sanguine or deceiving "inventors" here. They have been told of innumerable "processes," each of which was the true and only one to "take all the metal out of the ore;" and when their processes failed, they have not known whom to blame for the failure. Most of them have taken refuge in an incredulity as blind as was their former faith. An amusing conversation was related to us the other day by Mr. SECOR, which took place between himself and a Wall street capitalist, and illustrates so well this latest phase of ignorance, that we repeat the dialogue:—"You don't mean to say that you can successfully treat gold and silver ores?" "Yes, we do; we smelt them." "But what do you do with the quartz?" "Oh, that is simple enough: we add the proper fluxes, and melt the ores; the quartz forms part of the liquid slag, and the heavy metals, gold, silver, and lead, are precipitated from this liquid, and collected in a mass at the bottom. That is one very simple way." *"My dear sir, if you can really do that, you have made the greatest discovery in the world, It is worth a fortune to you! We have been waiting years for just such a process."*

Strange as it may seem, there are many men who fancy that the ores of this country present new and mysterious chemical problems, and that the difficulty of treating them must be overcome by new discoveries: not knowing that the art of metallurgy is as old as Tubal Cain, and, although it is susceptible of improvements, has reached a degree of perfection quite as high as that attained by any other technical industry. For the instruction of such men, a metallurgical establishment where they may see the results of skill and experience in actual operations, is invaluable. We do not think that "job work," such as the Manhattan is prepared to execute, would of itself constitute, in this city, an extensive and permanent business; but it certainly forms a most useful and important incidental part of such a business, and will afford a check upon blundering processes and a means of experimenting with ores and apparatus, which could be obtained in no other way. Unfortunately most of the establishments which profess to reduce ores in this city, are interested mainly in the introduction of patent machinery, and therefore do not afford impartial tests. Even SECOR and SWAN think of introducing a patent amalgamator. However good it may be, we wish it belonged to some one else, that we might point to one concern which had no possible interest in one apparatus more than another. We do not think, however, that they will allow the amalgamator to overshadow what they have laid down as the plan of their legitimate business; and it seems to be, moreover, a very simple machine, without any whimsical absurdities, such as set men wild, first with expectation, and then with disgust.

We have called attention to this enterprise, and shall be glad to encourage it, not so much for what it is, as for what it promises to become. It presents now a fair beginning, is evidently in the hands of energetic and intelligent men, and we trust will grow into a great institution, worthy to be compared with the best European establishments. At a recent visit, we were much pleased with the progress made since we last inspected the works, several months ago. There are now half a dozen large and small furnaces of different kinds—mainly reverberatories,—for the treatment of gold, silver, copper, and lead ores. The amalgamator we have referred to is undergoing a series of severe working trials, with large quantities of ore and tailings. We shall take another opportunity to describe and discuss it. Auriferous sulphurets are thoroughly desulphurized before they are amalgamated—an example which all mill-men would do well to imitate. Mr. WILLIAM WEST, formerly of Swansea, Wales, who is engaged at the works, has introduced some manipulations of ores containing copper, silver and gold, the merits of which we are not prepared to judge, since some parts of the process are his own secret. The best proof of the *bona fide* character of the work, is the fact that the proprietors are able and willing to buy ores on assay. The present capacity of the works is about ten tons daily; but they are to be greatly enlarged, we understand; and we shall be glad to chronicle their progress and success.

Correspondence.

[To insure insertion of Correspondence in our columns the full name and address of the writer must be given.]

The Boring in Walker Valley—De Blessier to the Rescue.

BURLINGHAM, SULLIVAN COUNTY, N. Y.,
November 24, 1867.

EDITORS AMERICAN JOURNAL OF MINING:

In your journal of the 16th inst., you annex to the boring record of the Walker Valley suppositions and advice, which I could not help noticing; and I have to ask some questions in regard to your, to me, entirely new and curious remarks.

Where are the bituminous Devonian and Silurian slates in New York exposed? Do coal shales, no matter whether bituminous or carboniferous—conglomerates, sandstone, slate, etc.,—not belong to the carboniferous formation? Are not these matters formed in the carboniferous periods, and are not the coal seams found among these series? As for the advice to the company, permit me to inform you, that, before the commencement of boring, this section has been examined by eminent geologists, and that we have, during the progress of boring, now realized all the expectations which they have entertained of this coal region. Our borings tell facts: and you know they are stubborn, and cannot be overthrown by silly remarks. As for myself, I never have taken any advice from editors in regard to the rocks belonging to the coal formation. I rely on practical facts and observations.

Many hundred mining companies in Nevada, Colorado, and the other great mining districts, have ores yielding, according to assays from New York and other places, from fifty to many thousand dollars per ton; and, notwithstanding this immense yield, with a few exceptions, every penny-weight they make costs them from five to fifteen dollars in greenbacks. I think in such sections good advice is needed. This company is not a stock company: it cousists only of a few gentlemen, and they desire no advice or puff from any journal; they also are aware of the value of their property.

If you give these few lines a place in your journal, you will oblige, &c.,

CHARLES A. DE BLESSIER.
Geologist and Mining Engineer.

[Probably our irate friend, who never takes advice from editors, does not really care to have his questions answered. We venture, however, to indulge in a few "silly remarks;" and in order to be as silly as possible, we shall quote from the official report on the Geology of the State of New York. The Devonian and Silurian strata are exposed in this State in localities too numerous to mention; but we believe Mr. DE BLESSIER can find both groups in Sullivan county. The Geological Report says that five sections of the Catskill (Devonian) rocks are exposed "on all the streams and roads of Sullivan county, except the town of Mamakating, and the east parts of those of Forestburgh and Fallsburgh," and the Helderberg (Silurian) rocks appear in the Mamakating Valley, in the same county. (Vide *Nat. Hist. of New York, Part IV., Geology, First Dist., pp.* 307, 332 and elsewhere.) To the question whether bituminous and carbonaceous shales, conglomerates, sandstones, slates, etc., always belong to the carboniferous period, we must mildly reply, no. Not even coal always belongs to the carboniferous period. There are local occurrences of anthracite, for instance, in the Catskill rocks of Sullivan county—one of which is described in the volume above referred to, p. 315. The paragraph is recommended for Mr. DE BLESSIER'S perusal.

"A 'coal mine' has been opened in Sullivan county, about one and a half miles west of Red Bridge, which latter place is where the line between Ulster and Sullivan is crossed by the Delaware and Hudson canal. It is a bed of black carbonaceous shale, four and a half to five feet thick, with thin seams of anthracite interlaminated, from the thickness of paper to that of thick pasteboard. The shale contains vegetable impressions. It has been opened on the right bank of the Sandberg creek, about thirty feet deep in the dip of the strata; and a seam of pure anthracite *is said* to occur in the shale, six to nine inches thick. I did not see this, the mine being filled with water. * * * * It is presumed there are no seams of workable coal in the vicinity; still, if there is a coal formation in the portion of the State under my examination, it will probably be found in this region of upturned rocks, *and on the highest peaks of the Catskills.*"

Does Mr. DE BLESSIER expect to reach the geological horizon of the highest peaks of the Catskills, by *boring* in Walker Valley? It is well that he has already "realized all the expectations which he has entertained of this coal-region;" but we would like to know what those modest expectations are, which have been so easily satisfied. If all he wishes is the pleasure of boring, bringing up odoriferous water, and bits of carbonaceous rock, conglomerate, slate, etc., he may be tolerably certain of going a couple of thousand feet with ever-fresh delight. The select party of gentlemen who do not wish a puff from any journal, may rest in peace; they are not in the least danger of such treatment.—ED. AM. JOUR. OF MINING.

Report of Committee of the Late Fair on Pumps.

We here publish the report of the Committee—Messrs. Isaac V. Holmes, Wm. A. Selden, and Chas. E. Emery, on Pumps exhibited at the late Fair of the American Institute. The committee divide their report into two parts, being respectively their conclusions on the pumps practically tested, and those merely examined.

FIRST DIVISION—ARTICLES PRACTICALLY TESTED.

No. 786, steam pump, James Clayton; No. 661, do., Knowles & Sibley; No. 668, do., Woodward Steam Pump Co.; No. 929, do., Campbell & Hardick; No. 662, centrifugal pump, Turbinate Pump Co.; No. 969 steam valveless pump, Chappell Manufactur-Co.

To ascertain the comparative merits of the steam pumps, each was in turn placed over a large tank, from which it received water; said water being delivered into the measuring tanks, of which there were two, so arranged that one was being filled while the other was emptying into the lower reservoir. Each pump was furnished with steam from the same boiler, and so far as it was possible the same pipes were used in all cases.

First Trial.—To determine the relative economy the pump was put in regular operation, and the trial commenced when the water-level in the boiler fell by evaporation to a mark on the boiler-gauge, and ended when the water had fallen to a similar mark placed six inches below. A steam guage, attached to the boiler, showed sixty pounds at the commencement of the trial, and the fire was so regulated as to keep it at the same pressure while it continued. In this way the quantity of steam used by each pump was made practically the same. Attached to the discharge chamber was a pressure gauge, and by means of a stop-valve the pump delivered its water against a pressure of sixty pounds per square inch into the measuring tanks. During this trial, the power exerted by the engine was measured by the indicator, while the cost of the power was estimated from the quantity of water evaporated in the boiler, and the duty of the pump by the number of gallons delivered into the tanks.

Second Trial.—To determine the maximum rate of discharge with a pressure of sixty pounds on the boiler, and delivery against a pressure of sixty pounds, the pump to execute its maximum capacity of discharge.

Third Trial.—To determine the minimum rate of discharge with a pressure of sixty pounds on the boiler, and delivering against a pressure of sixty pounds, the pump to show the slowest practical speed at which it can deliver water.

Fourth Trial.—To ascertain the time required to show pump valves. The trial commenced at a given signal when the pump was delivering water under pressure. One man then to stop the pump, remove the bonnets, show the valves, replace the bonnets, and start the pump again. Time was noted as soon as the joints proved tight under pressure.

Fifth Trial.—To show the condition of steam valves and piston under the boiler pressure of sixty pounds, with the cylinder head removed.

The results of the trials are condensed in the following tables:

NAME OF PUMPS.	Clayton,	Niagara,	Woodward,	Knowles,	Niagara,
Description of Pumps.	"	"	Crank,	"	Direct.
Diameter of Steam Cylinders. In.	"	9	12	10	12
Diameter of Water Cylinders. In.	9.5.06	5	7	6	7.12.16
Length of stroke. In.	7.5	7	6	6	6
Pressures. Steam. Lbs.	60	60	60	60	60
Pressures. Water. Lbs.	60	60	60	60	60
Total Time. Min.—Sec.	26'-40"	39'-01"	39'-01"	26'.20"	28'-40"
Total Revolutions.	3245	3693	2339	1555	1967
Double strokes per minute.	88.52	94.65	95.90	59.06	47.08
Piston Speed. Ft. pr. min.	110.64	111.36	95.90	111.23	96.63
Horse Power.	10.38	9.65	13.41	11.71	12.16
Coal per Horse Power per hour. Lbs.	8.012	8.096	9.807	9.884	8.744
Water per minute delivered by pump. Gal's.	54.57	104.40	166.27	148.47	181.65
Gallons delivered per horse power, per minute. Gal's.	5.24	10.82	12.39	12.67	14.10
Total quantity of water delivered, by pump using same steam. Cub. ft.	265.78	543.17	513.59	521.23	694.32
Percentage of calculated quantity delivered. Pr. ct.	49	95.4	88.5	93.6	96
2d Test, MAXIMUM CAPACITY. Steam Pressure.	60	60 to 50	60 to 50	60 to 50	60
2d Test, MAXIMUM CAPACITY. Double strokes per minute.	141.0	141.5	125.0	181.5	87.5
2d Test, MAXIMUM CAPACITY. Water delivered by pump per minute. Gals.	65.34	139.3	181.5	262.3	279.9
2d Test, MAXIMUM CAPACITY. Percentage of calculated quantity delivered. Pr. ct.	36.7	85.1	82.3	98.0	86.5
3d Test, MIN. Do. Double strokes per minute.	54.2	32.5	24.5	2.5	.33
3d Test, MIN. Do. Water delivered per minute. Gals.	17.02	35.74	39.78	3.14	.5
4th Test, VALVES. Time required to show Valves, etc., of Pumps. Min.—Sec.	3'-33"	0'-43"	21'-25"	13'-45"	0'-42"
5th Test, CONDITION OF Piston.	Leaked a little.	"	Very Leaky.	Tight.	Leaked a little.
5th Test, CONDITION OF Valves.	"	"	"	"	Leaky.

1st Test, ECONOMY.

ANALYSIS OF TRIALS.

As it is desirable in some cases to use a steam pump as a steam engine, we have arranged and examined the pumps in two sections. First, simple steam pumps without crank; second, combined steam pumps and engines with cranks.

First Section.—Niagara direct acting pump; Knowles do.

Second Section.—Woodward crank pump; Clayton do.; Niagara do.

FIRST SECTION.

Comparing the results of the "Niagara" and the "Knowles," the committee find that the latter delivered the largest per centage of the calculated quantity (averaging the results of the first and second trials); but the "Niagara" discharged the greatest number of gallons per horse-power per minute. On a trial for economy, both using the same quantity of steam, and at the same pressure, the "Niagara" pump delivered 694 cubic feet, and the "Knowles" 521 cubic feet, against a pressure equal to that in the boiler. Comparing pumps of the same size by these makers, the maximum and minimum rates of discharge would undoubtedly be substantially the same.

The "Niagara" was stopped, its pump valves shown, and the pump started again in 42 seconds. The "Knowles" required for the same 13¾ minutes. This would be an important difference on ship-board, when in time of danger the valves are liable to choke every few minutes.

The "Knowles" is tastful in appearance and excellent in design. The workmanship is uniformly superior and reflects great credit on the manufacturers. The "Niagara" shows no attempt at finish or external workmanship; but, from the result it gives, we judge that all essential parts are well fitted. We therefore decide for the

FIRST SECTION: First Premium—"Niagara," direct acting pump, Campbell, Hardick & Bro., Brooklyn, N. Y. Second Pre-

mium—"Knowles," direct acting pump, Knowles & Sibley, Warren, Mass.

In regard to the combined steam pumps and engines, the table shows that the "Clayton" was slightly the most economical in the cost of horse-power, and second best in the time required to show the valves. But this pump did not deliver one-half as much water as other pumps using the same weight of steam. The "Woodward" delivered more water per horse-power than the "Niagara Crank," but the cost of each horse-power was greater, so that the "Niagara" gave the best economical results. The "Woodward" falls behind slightly in the percentage delivered of the pump piston development. These differences are, however, so small that we may consider that pumps of equal size would be substantially equal in economy and rates of discharge. In the trial to ascertain the time to show the pump valves, the "Niagara" was running again in 43 seconds, while the "Woodward" was 21 minutes and 25 seconds in accomplishing the same object. The "Niagara Crank" has, in addition, arrangements for disconnecting at will either the steam or pump pistons, so that the machine may be used either as a steam pump, a power pump, or a steam engine. This is an important feature, which is entirely lacking in the other pumps on exhibition. The "Woodward" has been long and favorably known. It is strong, durable, and reliable: but we consider the "Niagara Crank" its equal in these respects, besides possessing in addition the advantages above mentioned. We therefore decide for

SECOND SECTION: First Premium—Niagara Crank pump, Campbell, Hardick & Bro., Brooklyn, N. Y. Second Premium—Woodward Steam Pump Co., Centre street, N. Y.

In addition to the foregoing awards the committee recommend that there be given a first premium to Knowles & Sibley, Warren, Mass., and a second premium to Woodward Steam Pump Co., New York, for superior excellence in the workmanship of the articles exhibited by them in this group.

REMARKS.

A general impression is believed to exist that to make a reliable steam pump the reciprocating motion must be changed into a rotary by means of a crank. The early direct acting pumps which actuated the steam valve directly by tappets, could not successfully compete with crank pumps. But these trials prove conclusively to the committee that, for simple pumping purposes, the improved "Direct Acting Pumps" on exhibition are superior to any crank pump. The improvement which has made these pumps a success, consists in actuating the main steam valve by a secondary movement derived from a special steam piston. Comparing pumps on the two systems having the same sized steam and water cylinders, we find that the "Direct Acting Pumps" have the following advantages over crank pumps:

First. The direct acting pump occupies less space.

Second. The price is fully 20 per cent. less.

Third. Being of longer stroke it does not change the direction of the water so often to develope a given capacity.

Fourth. It imparts a more equal velocity to the water.

Fifth. It produces less jar when in operation at high speed under pressure.

Sixth. It can deliver a greater amount of water in a given time.

Seventh. It may be run as slow as desirable without fear of stopping.

Eighth. It will start at any part of the stroke, even when the steam and exhaust pipes are full of condensed water, by simply opening the steam valve, and will run under water in case of emergency.

No. 959—Steam Valveless Pump. Chappell Manufacturing Co., 99 Bank street, N. Y.

A two inch pump with fifty pounds steam on boiler delivered 150 gallons of water per minute against a head of six feet. The quantity of steam used proved that the pump is equal in economy to others of the same class, all of which are considerably interior in this respect to the ordinary steam pump. The Chappell pump is constructed with a new feature, whereby the current of steam may be changed, and the motion pipe quickly cleaned when it becomes choked. This is a valuable improvement. This pump is especially useful on ship-board to clear the bilges, and may be employed as a fire pump in case of emergency. We consider it with its improvements the best pump of its kind in the market, and recommend for it a first premium.

No. 962—Gerake Centrifugal Pump, Turbinate Pump Co., 112 Wall street, N. Y.

The power of this pump was measured by a dynamometer, and the water by the tanks before described. A five-inch pump required 736 revolutions and two and one-tenth horse power to deliver 343 gallons of water per minute against a head of six feet. This trial showed conclusively that a given quantity of water may be lifted a short distance with this pump much more economically than with an ordinary steam pump. The trial under pressure, obtained by throttling the discharge, did not give as good results as the steam pump. This pump is very efficient for drainage and circulating purposes where large masses of water are to be moved. It is simple in construction, with no parts liable to wear, or to get out or order, and we would recommend for it a first premium.

The foregoing comprise all of the cases, in which a practical trial was made, of the articles exhibited. The results show that such a trial should be made of all the machinery entered for competition. The mere professional opinion of a judge is not conclusive to others, as every man's judgement is necessarily influenced by the comparatively narrow field of his own experience. Nothing can be satisfactory and conclusive but the result of practical experiments, which are convincing to all. As these trials are the first made under the auspices of the American Institute, your committee desire to call attention to the general plan pursued.

Every person who buys a steam engine of any kind desires to get his work done at the least possible cost. Therefore with all reliable machinery the question is to know the cost of the useful work in pounds of coal. All experiments which do not ascertain this fact are worthless. Experience has proven that for short experiments the best way to ascertain the cost is to measure the quantity of water fed into the boiler in a given time to maintain the water level. This eliminates all errors due to unequal firing, and the number of pounds of coal of average quantity required to evaporate the feed water is easily estimated. Next the useful work must be in some way measured. This is shown in a pump by the quantity of water discharged against pressure. In an ordinary steam engine it should be measured by a dynamometer on the shafting, as the nett power can only be calculated approximately from indicator diagrams. In the pump trials the indicator was used in connection with the records of water evaporated by the boiler, and water discharged by the pump. The table shows therefore the cost of the indicated horse power, and of the useful work. It also indicates the particular fault of each pump. For example, the engine with the tightest piston gives the most economical result by the indicator, and the worst result of all in useful work, showing that the power was absorbed in friction, and in passing the water back and forth by a leaky pump piston. Another pump fell behind in the water delivered per horse power, but gained in economy of steam sufficient to overbalance the loss of friction. Other illustrations might be cited, but the foregoing are sufficient to show the value of practical trial.

SECOND DIVISION—ARTICLES EXAMINED BUT NOT TESTED.

In this portion of the report the committee review the various pumps to which a mere examination was accorded, and recommend premiums as in the list published in our last paper. We make the following extracts:

No. 661. Knowles Steam Hydraulic Pump. Knowles & Sibley, Warren, Mass.

The committee would speak in the highest terms of this arrangement, both as regards the design and application of steam direct to hydraulic work; and also of the workmanship which is of a very excellent character; and looking at it in relation to the economical working of hydraulic power the committee consider it as worthy of a first premium.

No. 929. Steam Air Pump. Campbell, Hardick & Bro. Brooklyn, N. Y.

In the application of steam to pumping air, the combination by which a small stream of water is made to pass through the air cylinder and valve chest so as to water pack the valves, is worthy of notice; and the committee would recommend for this pump a second premium.

No. 787. Rotary Steam and Belt Pump. Metropolitan Engine Co., N. Y.

The committee were much disappointed in not being able to have a practical test of this pump in competition with the reciprocating pumps. They therefore have to make their decision as to its merits from examination, and not from practical tests, which would have been much more satisfactory. The arrangement shows much ingenuity in the inventor; yet for a pump is quite complicated with packings and wearing pieces, which the committee think would be a serious objection when used with fluids charged with dirt or grit. In the application of the system as a steam cylinder the committee see points of excellence which meet approval, and would therefore recommend it as an article worthy your (the chairman's) notice, and deserving a second premium.

No. 947. Rotary Steam Pump. Henry C Dart & Co., Pine street, N. Y.

The same remarks will apply as regards the testing of this pump as was made by the committee in their report on No. 787. They would only add that they feel very sorry such an opportunity has been lost of comparing the relative economy of the rotary with the reciprocating system. As far as would be judged by examination, the committee were very favorably impressed with the arrangement of the pump, as combining great simplicity with freedom from friction by the pistons, and, when arranged as a power pump to be driven by belt, would consider it as well worthy your (the chairman's) notice, and deserving a second premium.

No. 300. West's Antifreezing Hand Pump. J. D. West, East Orange, N.J.

This upon information is found to contain many points of excellence, which go to make a good reliable pump. In construction it is simple, and easily taken apart for examination and repairs, one piece of leather forming all the valves. The secondary foot valve is an important feature, giving great steadiness of holding the water when lifting from great depths. In the well or farm pump we would call attention to the arrangement by which the water, of its own gravity, settles back to the barrel, and the surrounding of the barrel with an air chamber for protection from cold; so that the pump is never in the coldest weather disabled by frost—a very important consideration in the Northern States. Taking all into consideration, the committee are of opinion that it is the best pump of its kind, and which they find is sustained by the testimony of parties who have used them. They would, therefore, recommend a first premium.

No. 1,292. Wilcox Portable Steam Engine and Boiler. Wilcox Steam Engine Co., Providence, R. I.

A very fine specimen of a small portable steam engine and boiler. The engine commends itself for its nice workmanship and completeness, while the boiler is well worthy of notice as a good sample of cast iron boiler, made in sections, well fitted up and mounted. For parties wishing small power, and a very safe, reliable boiler, or for transportation in difficult parts of the country, where pieces of small weight is an object, this combination is well worthy of a first premium.

DIVIDENDS

Old Dominion S. M. Co., 50 cents per share, payable Dec. 1; Rutland Marble Co. 2½ per cent., payable Dec. 2; Ralston Oil Co. 3 per cent., on demand; United States Pet. Co., at 3 per cent. at 38 Pine street, quarterly, 2 per cent., payable Nov. 30; Ocean Oil Co., at 314 Market street, Philadelphia, monthly, 2 per cent. and an extra dividend of 5 cents per share, (25c. in all) payable Dec. 2; Washington and Walnut Bend Oil Co. at same place, 1 per cent., payable Dec. 2.

MEETINGS.

Boston and Chicago G. M. Co., of Colorado, at Parker House, Boston, Dec. 10, 3 p. m.; Toltic Consolidated M. Co., at 24 City Exchange, Boston, Dec. 30; Phillips' Pet. Co., at 48 Exchange place, Dec. 4; Manham Lead Co., at 40 Broadway, Dec 3; Ritchie Oil Co., at 13 William street, Dec. 4.

ASSESSMENTS.

Phoenix Copper Co., at 103 State street, Boston, $3 00 per share, due Dec. 3; St. Clair Mining Co., at 66 State street, Boston, $1 00 per share, due Jan. 1, 1868.

STATEMENTS.

A San Francisco telegram, dated Nov. 27, announces that the Hale and Norcross Mining Company have increased their capital stock to $1,200,000—$1,500 shares.

THE REVENUE EXTENSION SILVER MINING COMPANY OF NEVADA has been quietly but persistently proceeding with the development of their mine on Lander Hill, near Austen, Nevada. The exploitations carried out upon this mine, during the summer of 1866, were sufficient to prove it a property of great value, and which systematic and economical working would render highly profitable. Unfortunately for the success of the company, the funds on hand proved insufficient, and work was suspended, after a depth of two hundred feet had been reached. Operations were, however, resumed in July last, since when, exploitations to the extent of 262 feet upon the vein have been made, and under the judicious management of a Superintendent, who appears to have the true interests of the company at heart, rather than temporary profit. The mine has been opened so as to permit of large quantities of pay ore being extracted. This is now being taken to mill, daily, and the Revenue Extension will soon prove to its shareholders that it is worthy of the representations made of it. The triumph of this company over the obstacles presented, is another evidence that honest economy and patient labor will ensure success in Nevada as elsewhere. (Communicated.)

BELLE MONTE FURNACE, IRON AND COAL COMPANY, OF BOULDER COUNTY, COLORADO.

The property of this company consists of two estates, recently consolidated, viz.: the "Belle Monte Furnace," with 800 acres, and the "Profile Butte," with 960 acres, containing in the aggregate 1,760 acres, throughout the entire length of which extends a wide belt of rich mineral deposits. In this belt are found, in inexhaustible quantities, iron ore, coal and fire-clay. There are eleven distinct veins of coal upon this estate. The most extensive development occurs within a few rods of the "Furnace" on the Belle Monte estate, being now 250 feet deep, horizontally, and showing a depth of coal of from twelve to fifteen feet in thickness, and about fifty feet in width. The development upon "Profile Butte" consists of two tunnels, about seventy-five feet each, which, at this depth, come together and show an average thickness of coal of from seven to ten feet, and about twelve to fourteen feet in width. The iron ore occurs in immense strata, varying from 1,200 to 1,500 feet, running throughout the entire length and breadth of the estates. There having been already expended about $100,000 in substantial improvements and developments on the two estates, under careful and judicious management, makes the property available for immediate results. Too much importance cannot be placed upon the fact of the consolidation of these two estates, for it makes one interest of the only reliable region of coal and iron, fully and fairly developed and tested in every way, to be found, not only in Colorado, but even the States of Nebraska and Kansas and the adjoining Territories of Dakota and Montana; and it is a well authenticated fact, that the supply of coal and iron, for this immense extent of country, must be taken from this estate. The entire property is held in fee simple and is situated within a short distance of the eastern base of the Rocky Mountain Range. The South Boulder and Coal creek streams, passing out from the mountains, flow directly through the property, affording never-failing water powers, which can be used at any season of the year. The Colorado Central and Pacific Railroad, being a branch of the great Union Pacific Railroad, will pass directly by the estate, which is distant from the gold and silver producing mines about twenty-five miles, and about fifteen miles from Denver and Golden Cities. The immense quantity of iron which is used throughout the mining regions of Colorado has hitherto been freighted from the Eastern States at heavy cost for transportation, making the iron very expensive; but here, on the company's property, lie strong and very productive veins of pure iron ore, which are easily worked, and it has been demonstrated by the practical operation of the furnace erected upon the property, that iron of the best quality for the railroad, mining machinery, and, in fact, all useful objects, can be made here, at a much less cost than it can be transported from the East. Most of the castings made at the foundry of Messrs. Langford & Co., of Blackhawk, the most extensive one in Colorado, have been from the pig iron produced at the Belle Monte Furnace. The coal, limestone, and all the crude materials for manufacturing, occur in close proximity to the iron ore.

The property has been so extensively examined and reported upon by the most scientific and practical business men, both resident in and visiting Colorado, and, in fact, is so widely and generally known, that a brief view will here be deemed sufficient of its leading characteristics before presenting in full some of the various reports, to which attention is particularly called.

COAL.—The development of coal, as shown by eleven distinct veins opened by tunneling on this property, proves it by far the most extensive as well as valuable west of Pennsylvania. The coal is extra-bituminous; the vein in the principal development is 12 to 14 feet in thickness, and, including three chambers which diverge from the tunnel at about 250 feet now, is over 50 feet in width of solid coal. There were over 2,000 tons sold from this tunnel last winter, 1866-7, which were mined at an expense of $3 per ton, and worth at the tunnel $5, and in Denver City $16, average cost of freightage by ox-teams there $9. As the railroad advances the demand for coal from this property will be enormous, and no one could examine the deposits without arriving at the conclusion that the supply will be for all time fully equal to the demand, as the coal is practically inexhaustible at this point. In connection with the subject of the coal found here, it may not be out of place to state, that the failure of a great many "processes" for the reduction of the rich but refractory sulphurets in the gold and silver ming regions, has been the means of demonstrating the fact, that the process of smelting, as it is carried on in the various mining districts of Europe, must necessarily be adopted for the saving of the gold and silver and other metals contained in the Colorado ores; to do this in a satisfactory manner the ores must be taken down by the railroad to this coal, where smelting works as extensive as "Barth & Son's," or "Vivian & Co's," of England, will be carred on. It is also in contemplation the erection of gas works in the City of Denver, now rapidly increasing in proportions and population, and the supply must be from this property. Dr. EDWARD M. KENT, of the U. S. Assay Office, New York, gives the following result from analysis of this coal:

Carbon	48.8
Volatile matter,	48.5
Ashes,	02.7
	100.0

And agreeably with a request, he copies from "Knapp's Technology, Vol. 2," for comparison with the above, the following analyses:

Derbyshire *Cannel* Coal, England.

Carbon,	48.36
Volatile matter,	47.00
Ashes,	4.64
	100.00

Burning Spring, Ohio Valley.

Carbon,	47.15
Volatile mat er,	48.00
Ashes,	4.85
	100.00

Sandy Ridge, Venango county, Pa.

Carbon,	49.80
Volatile matter,	43.32
Ashes,	7.00
	100.00

NOTE.—The above analyses show that the percentage of pure carbon contained in the coal of this property, quite equals that of the best coal in the world.

IRON.—There are some six or eight veins of iron ore of the red or brown hematite opened on this property, from which a large amount of ore has been raised. The outcroppings of ore at various places over the property show that there are at least 20 true veins of this ore on the lands. This supply of iron ore, of a kind excellent for all the purposes of the country, is not only easily and cheaply worked from the abundant deposits and veins, but it is practically inexhaustible.

See reports of Dr. F. V. Hayden, Surveyor-General Lessig, Major Powell, Prof. Maynard, and letters of A. G. Langford (foundryman in Blackford,) A. Sagendorf, Postmaster in Denver City, Hon. Moses Hallett, Chief-Justice of Colorado, Jerome B. Chaffee, U. S. Senator, and President First National Bank of Denver, annexed.

The following letter from Dr. Edward N. Kent, of the U. S. Assay Office, has been recently received, showing the results of his analysis of this ore:

NEW YORK, Oct. 22d, 1868:

WM. E. DARBY, Esq.—DEAR SIR: The sample of iron ore (brown hematite,) marked "'Belle Monte Furnace,' Boulder county, Colorado," analyzed for you, contains as follows:

Iron	41.3
Oxygen	17.7
Gangue	27.8
Water	12.4
Loss	0.8
	100.0

This is one of the most important ores of iron.

Yours respectfully, EDWARD M. KENT, Chemist.

FIRE-CLAY.—Here occur beds of clay of the purest quality for making fire brick, an article which has been much used in the construction of various furnaces, in the gold and silver-mining regions, and in the future will demand a large market. (See specimens.)

LIME.—To the west of these coal veins, and within a few rods of the main iron ore deposits, occurs an immense ledge of limestone, from which has been taken already all the lime used in the making of iron at the furnace and for building purposes. (See specimen.)

SANDSTONE.—There is also a very extensive quarry of sandstone on the property, from which the furnace has been built—the hewn blocks weighing from 5 to 6 tons.

WATER POWER.—As already stated, the "South Boulder" and "Coal Creek," two rapid and wide streams, afford extensive water powers on the property, and a flume ditch from the South Boulder stream has been brought for use of the blast furnace hereinbefore referred to.

"THE FURNACE."—There is an excellent blast furnace upon the property, from which a superior white pig iron is smelted. This furnace was erected by Mr. Joseph M. Marshall, one of the most reliable as well as oldest pioneers of Colorado. Mr. Marshall first started, in 1861, a foundry in Denver, which he subsequently removed to Blackhawk, the mining centre, and has still in extensive operation there in company with Mr. Langford. Mr. Marshall, seeing the rapid strides of the country was making, and the vast interest taken in her mines, made a careful examination, in company with certain scientific and practical men, of the entire country lying along the base of the Rocky Mountain Range between the Platte Canon and Cache Le Poudre, with a view of discovering iron ore and coal, and the "basin," as it is called, embracing an area of of 2½ miles, in which is comprised this property of the "Belle Monte Furnace" and "Profile Butte" was the only place they found iron ore in place, or indications of coal of such a character as to give hope for an extensive colliery upon a development, and accordingly Mr. Marshall established his furnace here and commenced active operations, and the results have far exceeded his most sanguine expectations.

COST OF WORKING, PROFITS, &C.

IRON.—Now that the railroad is completed to the Rocky Mountains, and will, by the coming spring, be running in the immediate vicinity of this property, the cost of living and labor will be reduced to a minimum by the ease with which all necessary material, machinery and provisions can be brought. Under the charter of the two branches of the railroads now in course of such rapid construction across the continent it is expressly provided that none

but iron of American manufacture can be used. It is estimated that there cannot be much less than 100,000 tons of iron needed in railroad uses alone west of the Missouri river, and it is positively averred that even triple this demand could be supplied (were furnaces of sufficient size erected) from this property. It is fair to estimate that the cost of producing a ton of iron on this property, with the advantages accruing within the next six months, will be:

Mining 2½ tons of iron ore, transporting it from mouth of adit to furnace, roasting it with coal, together with the cost of mining and transporting the necessary lime flux..	$5 50
Charcoal (200 bushels per ton of iron).....	20 00
Mabor, fuel, lubricating oil, &c., in smelting process.....	4 50
	$30 00

The iron already produced at the Belle Monte Furnace is of the first quality, equal in every respect to the best iron now selling in Wheeling, Va., and the iron market towns of Pennsylvania, for $55 per ton; so the value of the iron made—almost on the line of railroad, thus saving the cost of transportation of nearly 2,000 miles from the States—may readily be calculated, even if the expense should be increased on the above estimate.

COAL.—With the increased facilities above alluded to, it is fairly estimated there will be used for railroad purposes alone, including locomotives, machine shops, houses, &c., from this property, at least 250,000 tons a year, which, at $1 per ton profit, the very lowest estimate, would even be a source of enormous revenue.

FIRE-CLAY.—In the building of furnaces a large amount of this article must necessarily be used, and, in connection with the other manufacturing features this property presents, the erection of works for the making of fire-brick, pottery, tiles, &c., would be also a source of considerable profit.

RECAPITULATION.

It is evident from the foregoing details, substantiated by the strongest and most reliable reports, as well as a *reference* to any of the business men in Colorado,

1. That the property of the Belle Monte Furnace Iron and Coal Company possesses rich and apparently inexhaustible beds of iron ore, coal, limestone, fire-clay and sandstone.

2. That there are immense forests of pine and spruce timber suitable for charcoaling in the mountains adjoining the lands.

3. That water and water-powers are exceedingly abundant.

4. That the metallurgical works, shops, dwellings and other buildings are in good condition and arranged upon a remarkably practical and rational plan, and the machinery and apparatus are of the best kind.

It is hardly to be imagined an element of value and success which is not here enumerated. Upon such a basis, under proper management, the profits of this enterprise should be immense.

It is a well-established fact, evidenced by all the great manufacturing towns in the world, that the coal and iron fields of a country centralize wealth; the manufacturing and milling establishments of the country are attracted and brought to the coal and iron, and, indeed, the latter receive tribute from all the interests of the country.

Here, on this property, will be erected furnaces, rolling mills, iron works and machine shops for the uses of the railroads, and for manufacturing purposes, and here will most certainly be erected mills and works for the reduction by smelting of the ores carried down by the railroad from the gold and silver mines of Colorado. There can be no doubt entertained that this property must grow in value enormously, and will attract to it a constantly increasing population. It is not too much to predict that a town of permanent prosperity will, before many years, be established on this property, which will stand foremost in importance in Colorado, and, in fact, the great West. The enormous business and the populous towns of England derive existence and maintenance from the collieries and iron wares of their immediate vicinities. It is the coal and iron of Pennsylvania that has made the wealth of that State. The great English smelting works of "Barth & Sons," and "Vivian & Co.," and others, are all located in the immediate vicinity of the coal and iron-fields of Cornwall and Swansea, where they have established a large business, and depend for their principal supply on ores brought there from South America, Mexico, and other distant points, which, by the process of smelting, are made to pay a profit even after being carried such a distance; and it is an indisputable fact, that all the ores of England, Scotland and Ireland are transported hundreds of miles to the neighborhood of the measures and iron deposits. The geographical position of this property to the mining regions render it peculiarly well adapted for the prosecution of such works upon a very extensive scale upon Colorado ores; as also, when the great Pacific routes are completed, ores can easily be transported from the more distant States and Territories, in which coal is not found, and treated here. In this connection it should be stated, that Mr. Hermann, who visited Colorado last year, and came direct from the management of Messrs. Vivian's reduction works in England, gave it as his decided opinion, that the ores of Colorado should be carried to the neighborhood of this coal region and there reduced by the process of smelting.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men, and Others.

70,943.—APPARATUS FOR THE MANUFACTURE OF SALT.—Henry Beschkee, of Albany, New York.

I claim the arrangement and combination of the soaking-pan, K, drying-pans, D, and E, with the zigzag flues, P and T, when arranged and operating as herein described, and for the purposes set forth.

70,948.—STEAM ENGINES.—Eugene Bourson, of Brussels, Belgium.

I claim, 1. Connecting both ends of a steam-cylinder by means of a pipe, C, having one or more stop-cocks, a, substantially as described, so as to enable the engineer to stop or retard the motion of the piston, by conducting steam or water, or both, into the ends of the cylinder, substantially as herein shown and described.

2. The pipe, C, connecting the ends of the cylinder, when porvided with the stop-cocks, a a, and when combined with the blow-off pipes, c c, all made and operating substantially as herein shown and described.

3. Connecting the two cylinders of a locomotive engine with each other by means of a pipe, F, whereby steam, water, or both, can be conducted into the ends of the cylinders, substantially as and for the purpose herein shown and described.

70,978.—ROCK-DRILLING MACHINE.—George Downing, of Schuylerville, New York, assignor to himself, and Robert Hermance, of the same place.

I claim, 1. The crank-wheels, I, in combination with the shaft, H, double cams, G, drill-spindle, B, sliding plate, C, and upright part, D, as herein set forth, for the purpose specified.

2. The combination and arrangement of the lever, N, spring, B', arm, L, pawls, K, and, C', and ratchet-wheel, J, with each other, and with the drill-spindle, B, with its drill-point, A, sliding-point, G, and crank-wheel, I, substantially as herein shown and described, and for the purpose set forth.

3. The combination of the shaft, O, toothed wheels, P, pawls, S and V, arm, T, and racks, R, with each other and with the sliding plate, C, and upright part, D, of the frame of the machine, substantially as herein shown and described, and for the purpose set forth.

4. The upright part, D, of the frame, connected to the horizontal part, by means of hinges, X, and adjustable hooks, y, substantially as herein shown and described, and for the purpose set forth.

70,990.—MANUFACTURE OF WHITE LEAD.—Isaac M. Gattman, of New York, N. Y.

I claim, 1. Subjecting a strong and hot solution of the basic acetate of lead to a current of carbonic acid gas, substantially as and for the purpose herein described.

2. Applying steam in connection with a current of carbonic acid gas to a strong and hot solution of basic acetate of lead, substantially as and for the purpose specified.

3. Correcting defective precipitate of neutral carbonate of lead, formed by the current of carbonic acid gas when the solution of basic acetate of lead may be too weak, by boiling it in a stronger solution of basic acetate of lead, as herein set forth.

4. The manufacture of pure amorphous white lead by the method substantially as herein described.

70,995.—FURNACES FOR ROASTING ORES.—Henry Goulding, of Silver City, Nevada.

I claim, 1. The roasting of ores in moulds or chambers, substantially as described.

2. The arrangement of moulds containing ores to be roasted, so that they can be gradually brought nearer the fire or removed from it, substantially as described.

3. Removing the moulds containing ores from the fire while undergoing the process, so that the decomposition may be conducted without additional heat, substantially as described.

4. Placing a freshly-filled mould containing unroasted ore upon the top of a mould that has been removed from the fire, for the purpose of utilizing the excess of heat, substantially as described.

5. The arrangement of furnace, cooler, and crane, as described, for the purpose described.

6. The conducting of the flue through water, or its equivalent, for the purpose of condensing the volatile matter, when used in connection with ores roasted in moulds, substantially as described.

71,004.—METHOD OF DRYING GUNPOWDER.—E. E. Hendrick, Carbondale, Pa.

I claim the dessication of gunpowder, by submitting the same in vacuo to a removal of the atmospheric pressure, for the purpose and in the manner substantially as described.

71,011.—AMALGAMATORS.—Alfred Horn, of Silver City, Nevada.

I claim, 1. The application of a scraper or distributor, C, to an amalgamating machine or pan, for the pulp, substantially as described.

2. Arranging the said distributor to an amalgamating machine, so that it may be easily adjusted to the wear of the shoes and dies, substantially as described.

71,015.—GOVERNORS FOR STEAM ENGINES.—Reuben K. Huntoon, of Boston, Massachusetts, assignor to himself and J. Augustus Lynch, of same place.

I claim the combination and arrangement of the close oil-vessel, I, and the open head or partition, H, with the case, A, the propeller, its shaft, and driving-gears, arranged within the vessel and case, substantially as described.

I also claim the combination as well as the arrangement of the arm, M, its shaft, N, wheel, U, chain, V, and weight, W, or the mechanical equivalent of such wheel, chain, and weight, with the propeller, its shaft, and the case of cases containing such propeller and shaft.

I also claim the combination of the guide-wheels, X X, or their equivalent, with the weight, W, its chain, V, and supporting-wheel, U, the shaft, N, arm, M, the propeller, its shaft, oil-reservoir or case, and operative mechanism, substantially as described.

I also claim the combination of the insulator, E, with the steam-valve case, and the governor made and applied thereto, substantially as set forth.

71,016.—VALVES FOR STEAM ENGINES.—Archibald Hutton, of St. Louis, Mo.

I claim the valve, A, when constructed with one or two port-openings, a3, and combined with the ports, a a1 a2, and the condenser-passage, B, as described and set forth.

On-dit about Minerals, &c.

☞ Reports from Puget Sound speak in glowing terms of the extent and productiveness of the coal fields of Washington Territory, that is to say, of the Puget Sound region. The Bellingham Bay mines are now being worked vigorously. The daily product is about one hundred tons, which will be increased to four hundred tons as soon as arrangements now in progress shall be completed. An analysis of this coal shows that it compares favorably in quality with the best coal known. At Clallam Bay there is a mine which has been worked with good results. At Stoluc-quamish coal is found in workable seams, but at present is inaccessible to market. The Seattle mines are also commanding great attention. The principal vein is twenty-five feet thick, and the coal is pronounced equal to any obtainable on this coast. The Lake Washington coal mines are eight or nine miles distant from Seattle, and preparations are making to work them on a large scale. Two companies have been incorporated to prosecute the work. Four veins have been opened, which are from seven to ten feet in thickness near the surface.

☞ To show the progression of Colorado as a gold producing territory, we may instance the operations of three companies there—the Black Hawk, Smith & Parmelee, Sensenderfer and Ophir companies, which, during the past year, have produced $575,000 worth of gold. Also the fact that the three banks of Central City, have bought and shipped $1,200,000 worth of gold during the year ending November 1, 1867. The *Register* says the banks of Denver have probably bought as much more, although part of it was from Montana.

☞ A dispatch to the Pittsburgh *Commercial*, says that on the 13th, at West Middlesex, Mercer county, Pa., the workmen employed by Col. James Hemphill, in sinking a shaft for ore or coal, struck a vein of rock, strongly intermixed with a substance at first supposed to be sulphur. Upon the examination of the rock by Col. Hemphill and his superintendent, Mr. Mills, and after severe tests, they pronounce it to be gold of superior quality, and capable of yielding $5,000 dollars to the ton. Just so!

☞ A German engineer states that oxide of chromium is the best substance for polishing steel. The article can easily be prepared by heating bi-chromate of potash to redness. It is also used for painting on porcelain. One equivalent of chromic acid is reduced to oxide of chromium, and on well washing the residue of the ignition neutral chromate of potash is washed away and the oxide is left behind.

☞ Professor Tozzetti of Florence has presented a note to the French Academy of sciences on the wax produced by the fig, cochineal (*coccus cacticus*), which contains about half its weight of cerotine. He states that it may be procured in such large quantities as warrant its use in the industrial arts.

☞ There is a stone quarried in Cornwell, Eng., called the Polyphant stone, which can be cut by a hand saw with ease when first mined, but in time becomes exceedingly hard. It occurs of a neutral grey color, and also of a green with red spots and is admired by architects for its chromatic effects.

☞ Granite found in Minnesota has been tested by the government geologists at Washington, and pronounced to be equal, if not superior, to any in the United States, and fully equal to Russian granite, known as the finest building material in Europe.

☞ A gold mine has been discovered in Peru, on the east side of the Green Mountains, and an assayer has been found who says after trial that the ore is the genuine thing.

☞ A quarry of good variegated marble was recently discovered, near Mechanicsburg, Cumberland county, Maryland. There is some talk of forming a company to work it.

☞ Immense beds of peat lie convenient to the city of St. Paul, Minn. A company has been organized there, and is about commencing operations to supply the city.

☞ Some experienced borers have left the Venango county oil regions to superintend the boring of oil wells in Pike county, Mo.

☞ A Colorado paper mentions "a mountain of plumbago ore situated not far from Empire."

All Sorts.

☞ A new trade has appeared in London, being a body of men who deodorize and manipulate, partly, decayed fish, so as to render them saleable as food. The London *Field* describes their mode of carrying on business, and says that few industries connected with the food supply are more disastrous than those connected with the sale of semi-decayed fish, and suggests that these "fish curers" should be licensed and compelled to submit to official inspection.

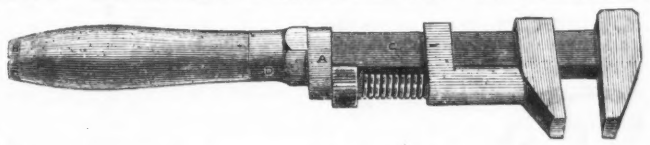
☞ The great curiosity of New Marlboro, Massachusetts, is the "tipping rock," which is as large as a load of hay, and weighs about fifty tons, but it is so nicely balanced that it can be moved by the hand, and is even made to vibrate by the wind. It stands upon a round topped hill, where there is no other rock except the one it rests upon, which is even with the surface, is balanced upon three points, and like a table on an unlevel floor, it can be tipped up till it touches a fourth projection.

☞ A party of capitalists recently visited Marsh's Railroad, which is being built to the summit of Mount Washington, and a new company has been organized, fixing the capital at $200,000. The Giant's Grove is being graded previous to erecting a large hotel on it, and the turnpike has been completed from that point to the railroad at the foot of Mt. Washington. A little over a mile of the railroad has been constructed, and it is expected the balance will be finished next year.

☞ The capital invested in railway enterprises in the United States is somewhere near two thousand millions of dollars, and the amount is rapidly growing larger from year to year. The Pacific railways will add one hundred and fifty millions within the next five years, and new lines and the extension of the present lines will probably add as much more to this great interest within that time.

☞ The Commerce of Chile for the financial year, is represented by over $100,000,000, in which England takes the first place; then come Peru, Australia, France, the United States, &c., in the order named. The government has at last yielded to the representations made to it for an inquiry into the best way of reforming the Custom-house tariff.

COLLINS & CO.'S
NEW PATENT SCREW WRENCH.



All consumers have noticed that their wrenches first fail by reason of the forcing back of the handle, and by the springing of the bar. Our improvement remedies both these defects, the bars being finished wider than any other wrench in market, and the handle cannot be displaced, as all strain on it is prevented by the screw thimble, D, (see cut.) Already adopted as the best by the principal railroads and machine shops, and for sale by Hardware Dealers generally. Address COLLINS & CO., 212 Water street, New York.
10:v4:xm

☞ A correspondent of the Washington *Chronicle*, writing from Lima, says:—The tributaries of the Amazon river have been found to be navigable until within one hundred and fifty miles from the Gulf of Guayaquil. This success, which will be of the greatest importance to the commercial, agricultural, and social interests of the republic, is, to a great extent, due to the untiring exertions of Senor Proano, who has just returned from a surveying expedition to the head of navigation upon the river Moron, and discovered the same to be navigable for large sized vessels.

☞ When Dr. Day was President of Yale College, a party went out with him once to practice surveying, and the President felt gratified with the intelligence evinced. Next day one of the party was examined. "How would you go to work to survey a piece of land?" The student hesitated. "Is a man were to come to you and wished to have his farm surveyed, what would you do?" "I—I—I should advise him to get somebody else to do it, sir."

☞ The supply of coal in Louisville, Ky., having run short, a large plow-manufacturer ran his engine an entire day with fuel made of old tan-bark, wet and mixed with coal slag—keeping up a full head of steam, at a cost of thirty cents for the day.

☞ The Pithole, Reno and Oil Creek railroad was sold at auction in Philadelphia, recently, for the benefit of the creditors of Culver, Reno & Co., for $121,000. Galusha A. Grow was the purchaser in behalf of New York parties. The original cost of the road was $1,053 000.

☞ Blunders sometimes become successes, just as occasionally a fool does a wise thing; but it isn't at all safe to make blunders a basis for the plans of life.

☞ Ancient and Modern Greece is now known among classical students as whale oil and petroleum.

☞ New York pays from one-sixth to one-seventh of the entire internal revenue of the United States.

Special Notices.

The Colwell, Willard & Shaw Manufacturing Company, makers of the admirable lead-encased block tin pipes, which have attracted so much attention of late, has opened a convenient branch office at 105 Reekman street, corner of Pearl, this city. The popularity of the manufacturer's improvement continues to increase as time elapses, and a prosperous and large business is the result. Their pipe is fast displacing the old-fashioned lead-pipe, and received the first premium at the late fair of the American Institute.

Messrs. Christoffel & Booth, of 201 Centre street, are manufacturers of a very neat and ingenious device in the shape of a Patent Elliptic Scraper, for cleaning and removing scale from boiler and other tubes. It seems to be just the article for accomplishing this purpose, and is said to leave the tubes as clean as new. The scrapers are made in many sizes, and are sold at a moderate price. We advise parties interested to call at the manufactory and examine them.

COAL.

CALDWELL, GORDON & CO.,
WHOLESALE DEALERS IN
ANTHRACITE AND BITUMINOUS COAL,
HENRY HEIL'S
CELEBRATED EAST FRANKLIN COAL,
Room 35 Trinity Building,
NO. 111 BROADWAY, NEW YORK.
S. CALDWELL, JR. F. A. HALL, N. P. GORDON, S. B. YOUNG.
BOSTON, Office 144 State St. PHILADELPHIA, 112 Walnut St.
3:2qp3

ENGLISH COAL AND CANNEL.
DESPARD COAL, from Baltimore,
PROVINCIAL COAL,
ANTHRACITE COAL,
For Sale in Lots to suit.
PARMELE BROS.,
AGENCY OF GEORGE WRIGHT & CO., LIVERPOOL,
Office, No. 32 PINE STREET, NEW YORK.
31:qp3 Yard, West 22d Street, near 10th Avenue.

REPPLIER, FREEMAN & CO.,
MINERS AND SHIPPERS OF
REPPLIER'S LOCUST MOUNTAIN, DUNCAN RED ASH,
AND
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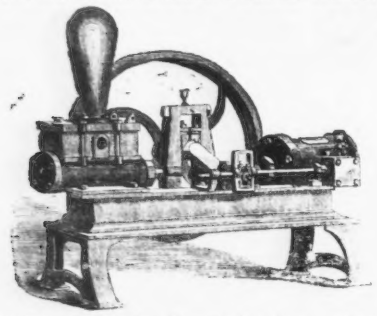

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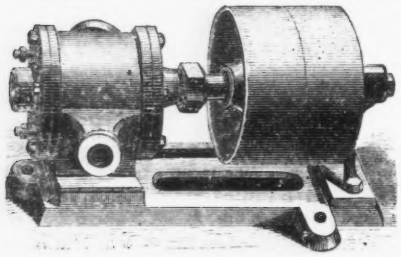

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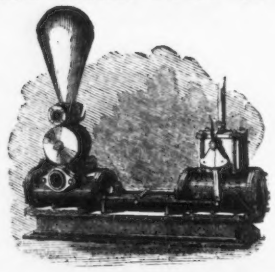

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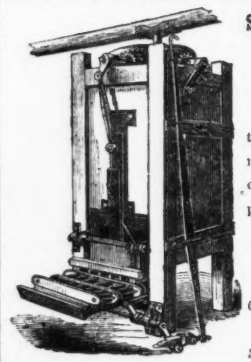

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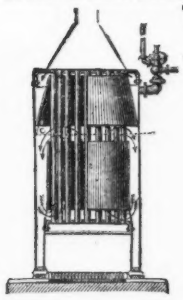

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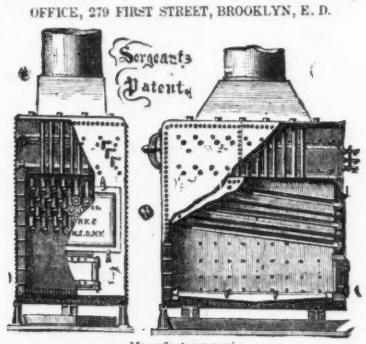

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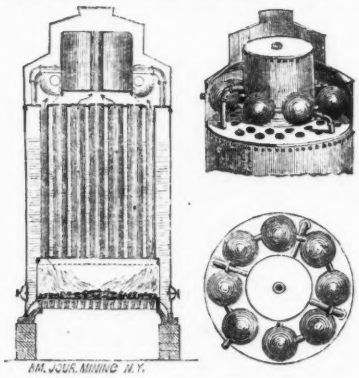

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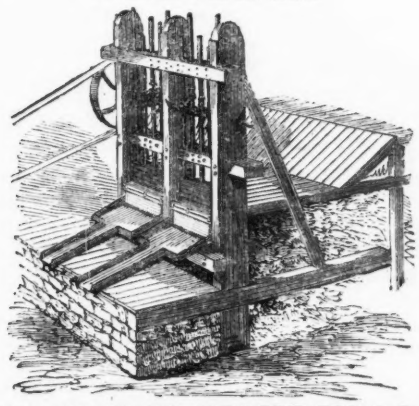

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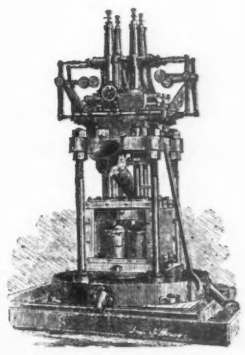

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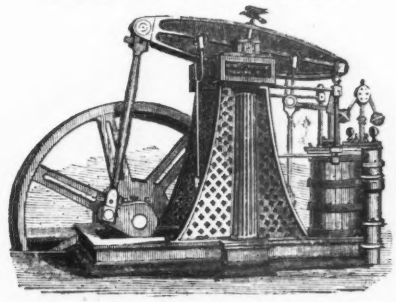

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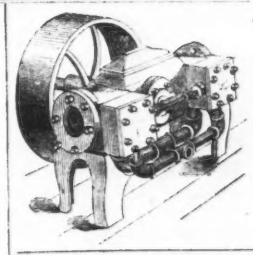

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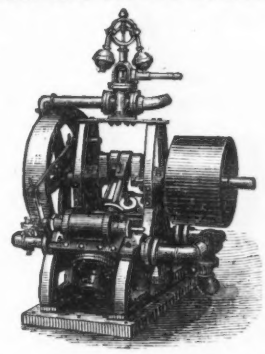

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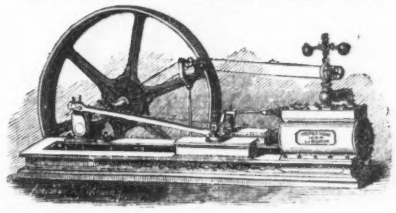

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THE ENTIRE GRAND LINE.

to the Pacific will be open for business in 1870. MORE THAN ONE-THIRD OF THE WORK HAS ALREADY BEEN DONE. MORE THAN ONE THIRD OF THE WHOLE LINE IS NOW IN RUNNING ORDER, AND MORE LABORERS ARE NOW EMPLOYED UPON IT THAN EVER BEFORE. More than

Forty Million Dollars in Money

have already been expended by the two powerful companies that have undertaken the enterprise, and there is no lack of funds for its most vigorous prosecution. When the United States Government found it necessary to secure the construction of the Union Pacific Railroad, to develop and protect its own interests, it gave the Companies authorized to build it such ample aid as should render its speedy completion beyond a doubt. The available means of the Union Pacific Railroad Company, derived from the Government and its own stockholders, may be briefly summed up as follows:

1.—United States Bonds

having thirty years to run and bearing six per cent. currency interest, at the rate of $16,0 0 per mile for 517 miles on the Plains; then at the rate of $48,000 per mile for 150 miles through the Rocky Mountains; then at the rate of $32,000 per mile for the remaining distance, for which the United States takes a *second lien* as security. The interest on these bonds is paid by the United States Government, which also pays the company one half the amount of its bills in money for transporting its freight, troops, mails, &c. The remaining half of these bills is placed to the company's credit, and forms a sinking fund which may finally discharge the whole amount of this lien. The claims against the Government since April of the current year amount to four and one half times this interest.

2.—First Mortgage Bonds.

By its charter the Company is permitted to issue its own First Mortgage Bonds to the same amount as the bonds issued by the Government, and *no more, and only as the road progresses*. The Trustees for the bondholders are the Hon. E. D. Morgan, U. S. Senator from New York, and the Hon. Oakes Ames, Member of the U. S. House of Representatives, who are responsible for the delivery of these bonds to the Company in strict accordance with the terms of the law.

3.—The Land Grant.

The Union Pacific Railroad Company has a land grant or absolute DONATION from the Government of 12,800 acres to the mile, on the line of the road, which will not be worth less than $1 50 per acre at the lowest valuation.

4.—The Capital Stock.

The authorized capital of the Union Pacific Railroad Company is $100,000,000, which over $5,000,000 have been paid on the work already done.

THE MEANS SUFFICIENT TO BUILD THE ROAD.

Contracts for the entire work of building 914 miles of first-class railroad west from Omaha, comprising much of the most difficult mountain work, and embracing every expense except surveying, have been made with responsible parties (who have already finished over 500 miles), at the average rate of sixty-eight thousand and fifty-eight dollars ($68,058) per mile. This price includes all necessary shops for construction and repairs of cars, depots, stations and all other incidental buildings, and also locomotives, passenger, baggage, and freight cars, and other requisite rolling-stock, to an amount that shall not be less than $5,000 per mile. Allowing the cost of the remaining one hundred and eighty-six of the eleven hundred miles assumed to be built by the Pacific Company to be $30,000 per mile.

The Total Cost of Eleven Hundred Miles will be as Follows:

914 miles, at $68,058	$62,205,012
186 miles, at $90,000	16,740,000
Add discounts on bonds, &c	4,500,000
Amount	$83,445,012

As the U. S. Bonds are equal to money, and the Company's own First Mortgage Bonds have a ready market, we have as the

Available Cash Resources for Building Eleven Hundred Miles:

U. S. Bonds	$29,328,000
First Mortgage Bonds	29,328,000
Capital Stock paid in on the work now done	5,369,750
Land Grant, 14,080,000 acres, at $1 50 per acre	21,120,000
Total	$85,145,750

The company have ample facilities for supplying any deficiency that may arise in means for construction. This may be done wholly or in part by additional subscriptions to capital stock.

Active inquiry has already been made for a portion of these lands, and arrangements are now proposed to offer a part of them for sale. While their whole value will not be available for some years to come, they will remain a very important source of revenue to the Company. The lands of the Illinois Central Railroad Company are selling at from $6 to $12 per acre, and other land-grant companies in the West are receiving equal prices for similar properties.

Future Business.

The most skeptical have never expressed a doubt that when the Union Pacific Railroad is finished the immense business that must flow over it, as the only railroad connecting the two grand divisions of the North American continent, will be one of the wonders of railway transportation; and as it will have no competitor it can always charge remunerative rates.

Earnings from Way Business.

During the quarter ending July 31, an average of 325 miles of the Union and Pacific Railroad was in operation. The Superintendent's Report shows the following result:

EARNINGS.

Passengers, Freight, Telegraph and Mails	$723,755 54
Transportation of Contractors' Materials and Men	479,283 41
Total	$1,203,038 95

EXPENSES.

Fuel, Repairs, Offices, Conductors, Trains, &c	$395,530 92
NET EARNINGS to balance	807,508 03
Total	$1,203,038 95

The net operating expenses on the commercial business for the quarter were $237,966 50. The account for the COMMERCIAL BUSINESS stands as follows:

Earnings for May, June and July	$723,755 54
Expenses " " "	232,966 50
Net Profit	$485,789 04

The amount of Bonds the Company can issue on 325 miles, at $16,000 per mile, is $5,200,000. Interest in gold, three months, at 6 per cent., on this sum, is $78,000; add 40 per cent. premium, to correspond with currency earnings, is $109,200—showing that the net earnings for this quarter were MORE THAN FOUR TIMES THE INTEREST on the First Mortgage Bonds on this length of road.

First Mortgage Bonds,

whose principal is so amply provided for, and whose interest is so thoroughly secured, must be classed among the SAFEST investments. They pay

SIX PER CENT. IN GOLD,

and are offered for the present at NINETY CENTS ON THE DOLLAR, and accrued interest at Six Per Cent. in Currency from July 1.

Many parties are taking advantage of the present high price of Government stocks to exchange for these Bonds, which are over FIFTEEN PER CENT CHEAPER, and, at the current rate of premium on gold, pay

OVER NINE PER CENT. INTEREST.

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CONTINENTAL NATIONAL BANK, No. 7 Nassau street,
CLARK, DODGE & Co., Bankers, No. 51 Wall street,
JOHN J. CISCO & SON, Bankers, No. 33 Wall street,

and by the Company's advertised Agents throughout the United States, of whom maps and descriptive pamphlets may be obtained on application. Remittances should be made in drafts or other funds par in New York, and the bonds will be sent free of charge by return express.

JOHN J. CISCO, Treasurer, New York.

October 28th, 1867. 19:1

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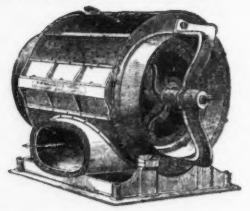

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Hugo, August 24, 1867.

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CHARLES SCHENK, M. E.

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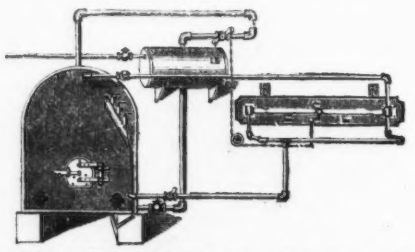

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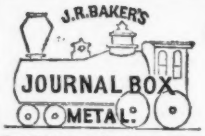

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